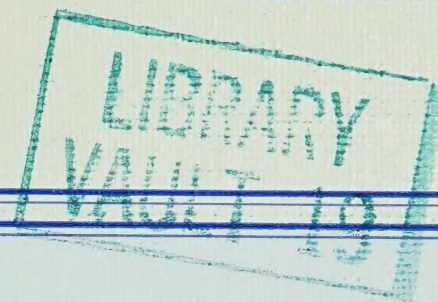


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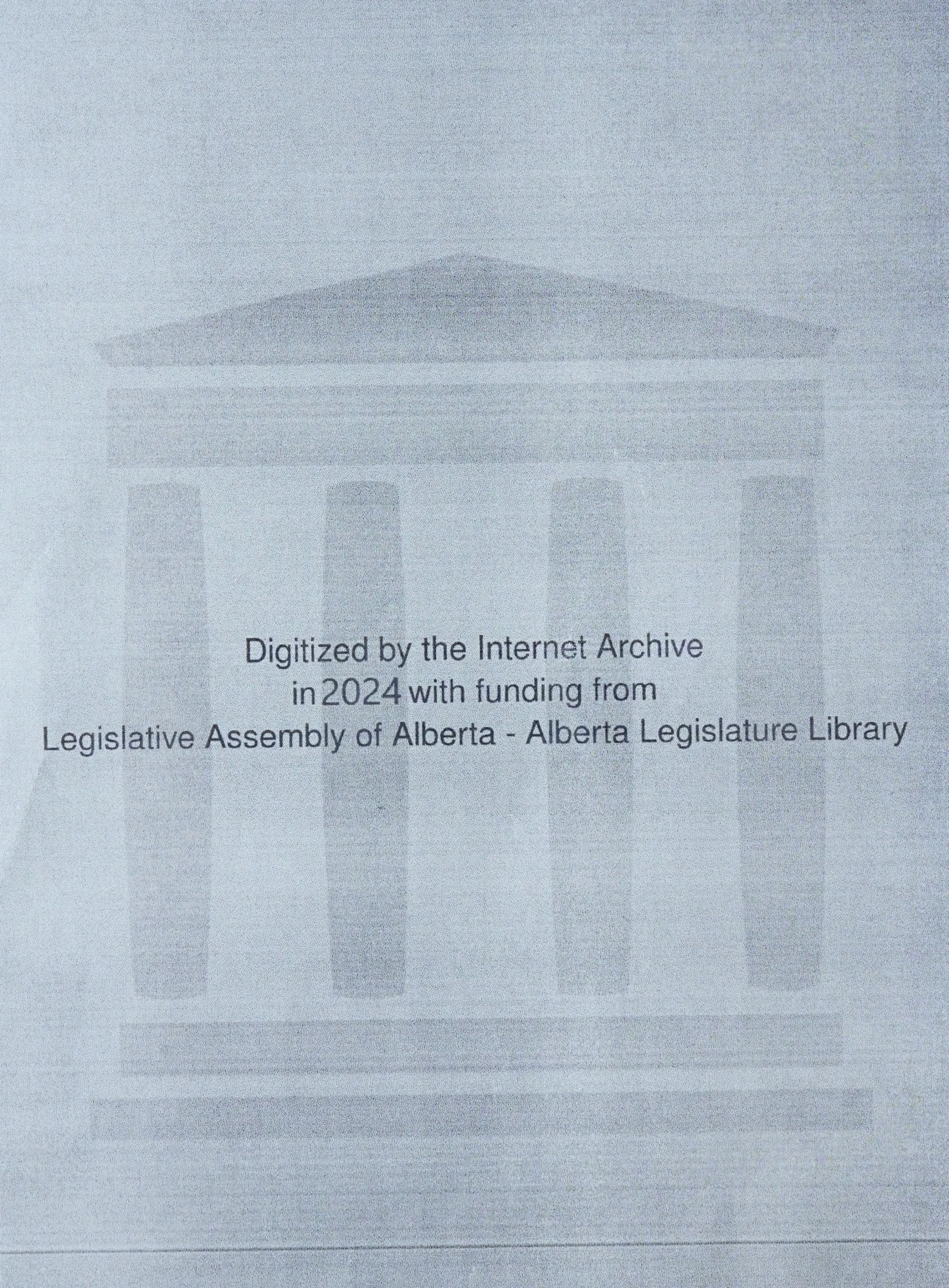
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IN THE MATTER OF AN APPLICATION OF
TRANS-CANADA PIPE LINES LIMITED UNDER
THE GAS RESOURCES PRESERVATION ACT

ENERGY RESOURCES CONSERVATION BOARD

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REPORT TO
THE LIEUTENANT GOVERNOR IN COUNCIL

IN THE MATTER OF AN APPLICATION OF
TRANS-CANADA PIPE LINES LIMITED UNDER
THE GAS RESOURCES PRESERVATION ACT

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I INTRODUCTION

The subject application, made by Trans-Canada Pipe Lines Limited under The Gas Resources Preservation Act, was heard by the Energy Resources Conservation Board on July 7 and 8, 1971, with G. W. Govier, P. Eng. and Vernon Millard sitting. The hearing followed immediately after the hearing by the Board of an application by Dome Petroleum Limited and Amoco Canada Petroleum Company Ltd. for a permit authorizing the removal of ethane from the Province.

TransCanada applied to have its Permit No. TC 70-10 amended by extending its term one year to October 31, 1995, by increasing the daily, annual and total volumes of gas that may be removed under the permit, and by making certain additions to and deletions from the list of fields, pools and areas from which gas may be removed. The applicant further proposed that Permit No. TC 70-10 be replaced by a new permit incorporating the proposed amendments and updating clause 3 of the permit. Further details of the application are given in section II of the report.

Date of Assessment and Period of Protection

At the hearing the applicant asked, and the Board agreed, that in considering the application the reserves of the Province should be estimated as of June 30, 1971. The applicant stated that in its application all material including reserve estimates and its calculation of surplus was updated

to that date.

The period for which the Board has assessed the requirements of the Province is 30 years commencing July 1, 1971.

Standard Conditions of Measurement

In this report, unless otherwise stated, volumes of gas are at the standard conditions of 14.65 pounds per square inch absolute and 60 degrees Fahrenheit.

Where reserves of gas are referred to herein, it means, unless otherwise specified, marketable reserves.

In this report "Mcf", "MMcf", "MMcfd", "Bcf" and "Tcf" mean respectively "thousand cubic feet", "million cubic feet", "million cubic feet per day", "billion cubic feet", and "trillion cubic feet" each measured at standard conditions unless otherwise specified.

Appearances

The persons listed in Table I - 1 appeared at the hearing. The interveners, Alberta and Southern, Consolidated, Dome, Union Gas, and the Town of Smoky Lake intervened for the purposes of cross-examination and argument only. When the Utility Companies submission was presented they were excused from the calling of a witness for this purpose because no one wished to cross-examine.

APPEARANCES

<u>Abbreviation of Name Used in Report</u>	<u>Represented by</u>	<u>Witnesses</u>
Trans-Canada Pipe Lines Limited	E. W. H. Mallabone G. F. Hulme	G. A. Leslie, P. Geol. R. B. Trimble, P. Eng. L. H. Larson, P. Geol. P. K. R. Cole, P. Geol.
Alberta and Southern Gas Co. Ltd.	R. A. MacKimmie, Q. C.	
Canadian Western Natural Gas Company Limited and Northwestern Utilities, Limited	B. V. Massie, Q. C.	
Consolidated Natural Gas Limited	G. D. Nichols	
Dome Petroleum Limited	C. E. Crawford	
Pacific Petroleum Ltd.	D. C. Kesteven, P. Eng.	D. C. Kesteven, P. Eng.
Union Gas Company of Canada, Limited	D. J. Elgee	
Town of Smoky Lake	R. J. Gibbs	

II SUBMISSION OF TRANS-CANADA PIPE LINES LIMITED

Proposed Permit Amendments

TransCanada applied for the amendment, revision and consolidation of Permit No. TC 70-10 by

- (a) extending the term thereof by one year to October 31, 1995,
- (b) increasing the total volume of gas that may be removed under the permit from 22.36 Tcf to 24.50 Tcf, the maximum daily volume from 3,118 MMcf to 3,355 MMcf and maximum annual volume from 1.002 Tcf to 1.100 Tcf,
- (c) adding to clause 3 of the terms and conditions of the permit reference to Permit No. 70-10,
- (d) adding to the pools, fields and areas named in the permit the following:

Edwand	Ferrybank	Harmattan-Elkton
Huxley	Rockyford	

- (e) deleting from the pools, fields and areas named in the permit the following:

Amisk	Cassils	Hughenden
Pelican	Willesden Green	Winnifred

TransCanada included in its submission a letter in which The Alberta Gas Trunk Line Company Limited stated that it was prepared to construct the facilities necessary to transport the additional volumes applied for.

Reserves

TransCanada estimated the initial marketable reserves available to it in the fields now in Permit No. TC 70-10 and in the new areas applied for to be some 26.8 Tcf with all but 461 Bcf in the proved category. The reserves comprise some 0.7 Tcf in new areas and 26.1 Tcf in fields named in Permit No. TC 70-10.

TransCanada did not make a detailed review of the reserves of each individual field, pool and areas in the Province. It took the Board's estimate made as of December 31, 1970 in OGCB Report No. 71-18⁽¹⁾ and adjusted it to June 30, 1971,

- (a) to reflect TransCanada's estimate of reserves in fields covered by Permit No. TC 70-10 (including the fields which it applied to have added to the permit) where TransCanada's estimate differed appreciably from the Board's,
- (b) for growth in other fields and areas in the Province as a result of recent drilling activity, and
- (c) for production which has occurred since December 31, 1970.

TransCanada calculated a total increase in gas reserves through reappraisal and growth by development of 2.3 Tcf and a reduction by production of 0.5 Tcf. The net effect of

(1) Reserves of Crude Oil, Gas, Natural Gas Liquids and Sulphur, Province of Alberta, December 31, 1970.

these changes was said by the applicant to increase the remaining established gas reserves of the Province by 1.8 Tcf to 45.1 Tcf or 47.6 Tcf on a 1000 British Thermal Units (Btu) per cubic foot equivalent basis. TransCanada added that the Board had details of new discoveries and it expected that the Board's reserve estimate would reflect such information.

TransCanada stated that the Harmattan-Elkton, Ricinus Cardium, Westeros and part of the Harmattan East reserves will be produced during the term of permit and accordingly should be removed from the deferred reserves category.

A discussion of individual pool reserve estimates is included in Appendix A.

Reserves under Contract

TransCanada submitted that it had under contract some 95 per cent of the gas it estimated was not committed to others in the fields now in its permits. About 98 per cent of the gas available to it in fields it applied to have added to its permit were said to be under contract to TransCanada.

Deliverability

TransCanada submitted deliverability schedules showing that during the term of the permit about 96 per cent of the 24.50 Tcf applied for would be produced from fields now in the permit and from the new fields it applied to have added

to the permit.

Trend in Growth of Reserves

The long term trend in the growth in initial marketable reserves of the Province was estimated by the applicant to be 2.7 Tcf per year. The trend in growth rate was determined from the initial marketable reserves of the Province at March 31, 1971, which TransCanada determined to be 58.8 Tcf, and the Board's estimate of 31.5 Tcf at December 31, 1960.

Further discussion of TransCanada's assessment of the trend in the growth of reserves is included in Appendix B.

Alberta Requirements

The applicant did not present its own forecast of Alberta's 30-year requirements but applied the Board forecast as outlined in OGCB Report 71-B⁽²⁾ to the period commencing July 1, 1971. TransCanada projected the permit related requirements by adjusting the Board's forecast presented in OGCB Report 71-A⁽³⁾ to allow for the additional volumes associated with this application.

Additional discussion of TransCanada's submission respecting requirements is included in Appendix C.

(2) Report and Decision Regarding Alberta's Future Requirements for Gas. February 1971.

(3) In the Matter of an Application of Alberta and Southern Gas Co. Ltd. and In the Matter of an Application of Consolidated Natural Gas Limited. Both Under The Gas Resources Preservation Act, 1956. January 1971.

Surplus

TransCanada submitted that there was an overall surplus of 7.1 Tcf of 1000 Btu gas in the Province at June 30, 1971. This volume included a contractable surplus of 3.6 Tcf and a future surplus of 3.5 Tcf. In calculating the future surplus, the applicant assumed future reserves from appreciation of established reserves and from future discoveries to be 10.8 Tcf.

Details of TransCanada's surplus calculations appear in Appendix D.

Protection of Gas Supply of the Town of Smoky Lake

TransCanada stated upon cross-examination on behalf of the Town of Smoky Lake, that there was adequate protection of a continued gas supply for the Town. Further details regarding this matter are presented in Section IV.

III SUBMISSIONS OF INTERVENERS

Pacific Petroleums Ltd.

Pacific supported TransCanada's statement that a scheme involving cycling of the gas cap in the Ricinus Cardium A Pool would not be economically attractive. It stated that an application for approval of a scheme for concurrent production of the oil accumulation and its associated gas cap would be submitted to the Board at a later date.

Town of Smoky Lake

The Town of Smoky Lake did not file an intervention to the hearing but was permitted by the Board to cross-examine the applicant and present argument. The Town did not oppose the application but intervened for the purpose of ensuring that there would be suitable protection for its gas supply from the Edwand Field.

This subject is considered more fully in Section IV.

IV MATTERS OF SPECIAL CONCERN

The Board believes that two matters arising out of the application are deserving of special consideration. These matters are discussed below as to views of the applicant, the interveners and the Board.

The Use of Deferred Reserves in Meeting Permit Requirements

(1) Views of TransCanada

TransCanada submitted that certain presently deferred reserves should be recognized in the meeting of its permit commitments. It supported its belief by observing that it was satisfied that production would commence from the reserves in the near future, that it had the major portion of the reserves under contract, that the Board's policy regarding the meeting of permit related requirements permitted reliance upon general evidence of gas availability and that it had provided fully for permit related requirements in accordance with the Board's policy.

(2) Views of the Board

The Board has reconsidered its position regarding the use of deferred reserves to meet permit commitments. While it continues its decision that deferred reserves should not be used to meet general permit requirements, it does see merit in making some provision for their use in meeting the permit related requirements for fuel and reprocessing shrinkage.

Commencing with this application the Board will accept a portion of the deferred reserves under contract to a permittee for the purpose of meeting the permittee's permit related requirements if the Board is certain that that portion of the reserves can be counted upon. For any particular application the portion will be determined having regard for the nature of the group of deferred reserves involved and the likely timing of production relative to the applicant's delivery requirements.

In adopting the above policy, the Board acknowledges that a substantial part of most deferred reserves are likely to be produced within the term, usually 25 years, of most permits. The Board emphasizes, however, that adoption of the policy does not mean that the Board has in anyway prejudged applications to produce deferred reserves.

In the case of the subject application, the Board is prepared to accept one-half of the deferred reserves under contract to TransCanada. The determination of the amount of deferred reserves to be considered is discussed in Appendix D.

Protection of the Gas Supply of the Town of Smoky Lake

The Town of Smoky Lake owns two gas wells in Section 26, Township 60, Range 16, West of the Fourth Meridian in the Edwand Field. The wells are completed in sands of the Upper Grand Rapids or Upper Mannville Formation, including the Colony member. There appears to be some possibility of interconnection between at least one of the Edwand gas pools in question

and a gas pool or pools in the adjacent Bellis Field and in an area between the fields as they were defined at the time of the hearing.

TransCanada has gas under contract in both fields and informed the Board that wells as close as two miles from the Town's wells are expected to be producing in 1971.

(1) Views of TransCanada

TransCanada stated that its interpretation was that the upper Colony sandstone pool in the Bellis Field, designated as "Pool 16-60-15" by TransCanada, is not in communication with the correlative "Pool 26-60-16" in the Edwand Field, one of the wells of which supplies gas to the Town of Smoky Lake. It added that the pools could be in communication but that "it is very indefinite as to whether or not any gas would migrate away from Section 26", the section in which the Town's wells are located. TransCanada expressed the opinion that it may take as long as ten years before pressure data would be meaningful in determining whether fluids were migrating from Section 26. TransCanada stated that it would be the responsibility of the producers of "Pool 16-60-15" to determine if communication between the pools is occurring and to take any steps necessary to ensure that gas does not migrate from Section 26.

The applicant contended that the terms and conditions in its permit to remove gas from Alberta would provide the Town of Smoky Lake with adequate protection of a continued supply

of gas. TransCanada stated that it had not endeavoured to negotiate a gas purchase contract with the Town of Smoky Lake.

(2) Views of the Town of Smoky Lake

The Town of Smoky Lake did not oppose the application of TransCanada but intervened for the purpose of ensuring that there would be some protection for its gas supply. The Town contended that, while the present permit requires TransCanada to make gas available to a community, the cost of gas supplied in this manner could be "far more than it presently costs the town". It stated that the pertinent permit condition was intended to meet the different circumstance in which a community has no gas supply of its own.

The Town of Smoky Lake suggested that "Pool 16-60-15" be excluded from TransCanada's permit during the year before the pool would be going on production to enable it and TransCanada to see whether some arrangement could not be made to protect the Town's gas supply. It suggested that, as a less attractive alternative, the Board consider requiring that withdrawals from the said pool be consistent with the Town's rate of withdrawals.

(3) Views of the Board

The Board believes it likely that gas owned by the Town of Smoky Lake would be subject to drainage by wells of others completed in the same pools, or pools in communication therewith through well bores, if such wells were producing at rates

consistent with purchase contracts being made for gas in the Bellis-Edwand area. The Board's present interpretation of these particular Upper Grand Rapids gas pools is that there are two wells other than those of the Town capable of taking production from one or more of the pools. It is the Board's understanding that these other wells cannot be expected to be placed on production for a year or two. The Board does accept, however, that there is a fair chance of lateral reservoir connection with other pools. The Board believes that possible interpool communication would not have a significant effect on the Town's rights or gas reserves for at least a year and probably several years. The Board does not agree with the Town's suggestion that the "Pool 16-60-15" be excluded from the proposed permit or that special restrictions be placed upon production by operators in the area at this time. The Board believes that the Town, TransCanada and those producers having capable gas wells in the immediate vicinity of the Town's wells should endeavour to work out an arrangement whereby the position of the Town with respect to its gas supply is not prejudiced. Failing such an arrangement, the Town would have the right to apply under section 35 or 36 of The Oil and Gas Conservation Act for an order distributing or regulating production of gas in the affected pool or pools.

V FINDINGS

The Board having heard publicly the application under The Gas Resources Preservation Act, of Trans-Canada Pipe Lines Limited, and having studied the evidence submitted by the applicant and the interveners at the public hearing, and having regard to the advice of its staff and to its own knowledge, finds as follows:

1. THE ESTABLISHED RESERVES OF GAS IN ALBERTA

The Board estimates the established reserves of remaining marketable gas in the Province at June 30, 1971 to be some 45.8 Tcf, or the equivalent of 48.4 Tcf of 1,000 Btu gas.

Of the latter total, some 0.9 Tcf are now considered to be beyond economic reach and some 4.0 Tcf will have production deferred, leaving a contractable reserve of 43.5 Tcf of 1,000 Btu gas.

The present estimate of 48.4 Tcf is some 0.4 Tcf more than the Board's estimate at December 31, 1970. The increase is due mainly to additional drilling in the Dunvegan Field.

Details of the Board's estimate and the discussion of the more significant changes since the Board's analysis as of December 31, 1970, are presented in Appendix A.

2. THE GROWTH OF RESERVES OF GAS IN ALBERTA
AND THE FUTURE RESERVES TO BE CONSIDERED

Using a policy formalized in 1969, the Board finds that a ten-year reserves growth rate of 2.4 Tcf per year and some 4.0 years of growth should be used in determining the relationship of future reserves to future requirements. The product of these factors results in future reserves to be considered of 9.6 Tcf.

Particulars of the determination of the above volume are presented in Appendix B.

3. THE PROTECTION OF THE GAS SUPPLY OF
THE TOWN OF SMOKY LAKE

The Board recognizes a possibility that gas owned by the Town of Smoky Lake in the Edwand Field could be subject to drainage by wells of others, but does not believe that there would be a significant effect for at least a year and probably several years.

The Board finds that it should not exclude certain pools in the Edwand Field from the proposed permit or place special restrictions upon gas withdrawals by producers in the area at this time. The Board believes that the Town of Smoky Lake, TransCanada and producers in the area should make some arrangement so that the Town's gas supply is not prejudiced, or, failing that, the Town should apply to the Board for an order regulating production from the affected pool or pools.

This matter is discussed in Section IV.

4. THE PRESENT AND FUTURE REQUIREMENTS FOR
GAS AND THE PRESENT PERMIT COMMITMENTS

The Board estimates Alberta's requirements for the 30 years, July 1, 1971 to June 30, 2001, to be 16.6 Tcf of 1,000 Btu gas, with a peak day requirement in the 30th year of 3.6 Bcf. The requirements are made up of general requirements of some 14.6 Tcf and special requirements of some 2.0 Tcf for Trunk Line and reprocessing plant fuel and shrinkage related to permits to remove gas from the Province. The present estimate represents an increase of some 0.6 Tcf in the total 30-year requirements since the Board's last estimate, which was for the period, September 1, 1970 to August 31, 2000. The increase relates mainly to the new 30-year period and to adjustments to the previous forecast based on more current experience.

The commitments remaining at June 30, 1971, associated with permits issued for removal of gas from the Province, total some 31.8 Tcf of 1,000 Btu gas. This volume is prior to any consideration of the subject and Dome-Amoco applications. The Board's estimates of Alberta's requirements and permit commitments are discussed in Appendix C.

5. THE MEETING OF ALBERTA'S 30-YEAR REQUIREMENTS
AND PRESENT PERMIT COMMITMENTS, AND THE
RESULTING SURPLUS

The Board estimates that reserves totalling some 21.4 Tcf of 1,000 Btu gas are necessary to meet the annual and peak day

requirements of Alberta for the 30-year period, July 1, 1971 to June 30, 2001. Of this total, 16.6 Tcf are required for actual deliveries and the remaining 4.8 Tcf are needed to meet the 30th-year peak day. Of the total deliveries, 14.6 Tcf are for general uses within the Province and the remaining 2.0 Tcf are for Trunk Line and reprocessing plant fuel and shrinkage related to the removal of gas from the Province.

The Board's estimate of 21.4 Tcf may be considered to consist of 9.7 Tcf of contractable requirements and 11.7 Tcf of remaining requirements, the latter being a measure of the reserves needed from sources not now under contract or connected to the Alberta market.

The Board estimates that 31.9 Tcf of 1,000 Btu gas are required to meet the present permit commitments. Of this amount, some 0.1 Tcf represent the reserves needed to ensure deliverability in the terminal year for those permits under which it is contemplated that substantial daily withdrawals for which protection has historically been provided will continue to the end of the permit term.

As discussed in Section IV, the Board has adopted a policy of permitting a portion of the deferred reserves under contract to a permittee to be used to meet permit related fuel and shrinkage requirements. The use of this policy in the present application results in a volume of 0.6 Tcf being available to TransCanada for the meeting of permit related requirements. This volume increases

the effective contractable reserves of the Province from 43.5 to 44.1 Tcf.

When the contractable requirements of 9.7 Tcf and the gas needed to satisfy the permit commitments of 31.9 Tcf are deducted from the effective contractable reserves of 44.1 Tcf, a contractable surplus of 2.5 Tcf results.

The remaining and future reserves totalling some 13.8 Tcf of 1,000 Btu gas consist of 3.4 Tcf of deferred gas which will be available within the 30-year period, 0.7 Tcf of gas now beyond economic reach but which the Board believes will be within economic reach and available within 30 years, 0.1 Tcf of reserves allocated to provide for the peak day in Permit No. WC 59-3 which will be available at the termination of the permit and within 30 years, and 9.6 Tcf of reserves not yet established as discussed earlier in these findings. Comparing the total with the 11.7 Tcf of remaining Alberta requirements, results in a surplus of 2.1 Tcf in the future category. This surplus results after full provision for the 4.0 TCF required from sources not now connected to meet Alberta's 30th-year peak day.

Details of the Board's analysis of these matters appear in Appendix D.

6. THE VOLUMES UNDER CONTRACT AND THE
PERMIT VOLUMES APPLIED FOR

The analysis of the Board with respect to the gas available to TransCanada and the remaining permit commitments including related fuel and reprocessing shrinkage indicates that TransCanada has available to it only some 410 Bcf of the additional volumes of 2,140 Bcf applied for.

7. THE APPLICATIONS FOR REMOVAL OF GAS
AND THE RESULTING SURPLUS

The Board finds that substantial surpluses of gas would exist in both the contractable and future categories after provision for granting of the application of Dome Petroleum Limited and Amoco Canada Petroleum Company Ltd. for removal of ethane and for granting of the reduced volumes of 410 Bcf to TransCanada as discussed in the preceding finding.

The net effect of granting the volumes referred to in the last paragraph above would be to increase the total permit commitments from 31.9 to 32.6 Tcf, and to decrease the contractable surplus from 2.5 to 1.8 Tcf. The future surplus would remain unchanged.

The Board thus finds that the reduced volumes found available to TransCanada are surplus to the requirements of the Province and the present permit commitments.

Details of the Board's analysis of these matters are presented in Appendix E.

8. THE OTHER MATTERS OF APPLICATION

Having considered and accepted the applicant's reasons for inclusion of certain pools, fields and areas in clause 5 of the said permit and for deletion of other pools, fields and areas, the Board agrees that the requested additions and deletions be made. The Board also finds in favour of the applicant's requests that the term of Permit No. TC 70-10 be extended by one year to October 31, 1995, and that clause 3 of the permit be amended to include reference to Permit No. TC 70-10.

The Board finds that it should not increase the maximum daily and annual permit volumes in the amounts applied for, but rather in relation to the fraction of the total volumes applied for which it is prepared to approve. Accordingly the Board has determined the appropriate maximum daily and annual volumes to be removed from the Province to be 3.160 Bcf and 1.020 Tcf, respectively.

The above matters are discussed in Appendices D and E.

9. THE DISPOSITION OF THE APPLICATION OF
TRANS-CANADA PIPE LINES LIMITED

In the light of its findings and its responsibility under the Act the Board is prepared, with the approval of the Lieutenant Governor in Council, to amend Permit No. TC 70-10 by increasing the volume of gas which TransCanada may remove from the Province by 410 Bcf, and by amending the term, the

maximum withdrawal rates and the list of fields included in the permit, as discussed above in these findings; the permit and amendments to be consolidated in the form shown in Appendix F and subject to the terms and conditions therein contained.

Respectfully submitted,

G. W. Govier, P. Eng.
Chairman

Vernon Millard
Vice Chairman

DATED at Calgary, Alberta

this 13th day of December, A.D. 1971.

APPENDIX A

THE ESTABLISHED RESERVES OF GAS IN ALBERTA

The Board estimates the remaining established reserves of marketable gas in Alberta at June 30, 1971, were 45.8 trillion cubic feet, or the equivalent of 48.4 trillion cubic feet of 1,000 Btu gas. The initial established reserves obtained by adding the cumulative production to June 30, 1971 of 12.0 trillion cubic feet were 57.8 trillion cubic feet. The estimate of remaining established reserves represents an increase on an actual heating value basis of some 0.4 trillion cubic feet since December 31, 1970, when the Board's estimate was 45.4 trillion cubic feet.

On an actual heating value basis, TransCanada estimated the remaining established reserves as of March 31, 1971, to have been 47.2 trillion cubic feet. TransCanada submitted reserve estimates for five fields in the "permit applied for" category, and for 24 other fields where significant increases had occurred since the Board's assessment of December 31, 1970, published in OGCB 71-18⁽¹⁾.

While only the established reserves are discussed in this report, the Board has calculated proved and probable reserves

(1) Reserves of Crude Oil, Gas, Natural Gas Liquids and Sulphur. Province of Alberta. December 31, 1970.

of gas. The definitions and interrelationships of these categories of reserves are as follows:

Proved Reserves are the recoverable gas reserves within the area of a pool completely delineated by drilled wells. The area may include undrilled spacing units if every reasonable probability that these reserves will be recovered is indicated by pressure-production response or by the pattern of the drilled wells.

Probable Reserves are the reserves of gas estimated to be recoverable from the pool beyond the proved limits of the pool. The probable pool limits are based on normal geological expectation.

Established Reserves are the reserves of gas whose existence and estimated amount can reasonably be counted upon. They include all of the proved reserves and a judgment portion (usually 50 per cent) of the probable reserves.

In its estimate of reserves, the Board has had regard for the estimates presented by the applicant and interveners at the hearing, the estimates included in various submissions presented recently to the Board, the individual reserve estimates made available by companies following informal contacts by the Board staff, and evaluations made by the staff. The Board and its staff have reviewed the reserves in many pools not considered by TransCanada in its application.

The majority of the increases in the Board's estimates of remaining marketable reserves in the six-month period ending June 30, 1971, were the result of successful development drilling in various pools, and the majority of the reductions were due to the production of gas during the period and to new reserve estimates based on the material balance and production decline methods of calculating reserves.

The Alberta Gas Trunk Line Company Limited recently purchased the northern part of a Peace River Oil Pipe Line Co. Ltd. line for use as a gas transmission line. The Board has not studied in detail the amount of gas that may be gathered as a result of this purchase; however, for the purpose of this report, the Board has reclassified the reserves of several fields and areas in the Rainbow-Zama region from beyond economic reach to within economic reach. A total of some 1.4 Tcf of gas on an as is heating value basis, or some 1.6 Tcf of 1,000 Btu gas was involved in the reclassification. Other aspects of this reclassification are discussed in Appendix D.

A comparison of the Board's reserve estimates for the year ending December 31, 1970 and at June 30, 1971, follows:

	<u>Actual Basis</u>	<u>1,000 Btu Basis</u>
	Tcf	Tcf
	(14.65 psia and 60°F)	
Remaining Established Reserves of Marketable Gas at December 31, 1970	45.4	48.0
Net Additions to Reserves	1.3	1.4
Marketable Gas Produced	0.9	1.0
Remaining Established Reserves of Marketable Gas at June 30, 1971	45.8	48.4

The tabulation which follows lists some of the larger pools for which there have been significant changes in the Board's estimates of initial marketable reserves (unadjusted for heating value) or for which there are significant differences between the Board's estimate and the reserve estimates of other interested parties. Not included in the tabulation are a number of major pools for which TransCanada has previously estimated larger reserves than has the Board. The disagreements have been discussed in previous Board reports and have not been resolved in the present review.

<u>Field or Area Pool or Stratum</u>	Board's Estimates		Other Estimates	
	as of		as of	
	Dec. 31 1970 (Bcf)	June 30 1971 (Bcf)	June 30, 1971 Estimators	Estimates (Bcf)
Brazeau River Elkton-Shunda A & Elkton-Shunda B	880	1020	TransCanada	1124
Cessford Basal Colorado A	730	590	TransCanada	588
Crossfield East Wabamun A	610	500	TransCanada	746
Dunvegan Debolt A, Debolt B & Deblot C	80	700	Alberta and Southern	748
Ghost Pine Upper Mannville Q	20	95	TransCanada	91
Gold Creek Wabamun A	230	130		
Jumping Pound West Rundle C	200	300	TransCanada	354
Pincher Creek Rundle A	540	380	TransCanada	355

<u>Field or Area Pool or Stratum</u>	Board's Estimates		Other Estimates	
	as of		as of	
	Dec. 31 1970 <u>(Bcf)</u>	June 30 1971 <u>(Bcf)</u>	June 30, 1971 <u>Estimators</u>	June 30, 1971 <u>Estimates</u> (Bcf)
Ricinus Cardium A	140	220	TransCanada	236*
Three Hills Creek Pekisko	150	80	Amoco	63**

* TransCanada's estimate includes the Ricinus Cardium I Pool.

** Amoco's estimate covered the area included in the Three Hills Creek Pekisko Unit #1, which comprises the major part of the pool.

Brazeau River Elkton-Shunda A and Elkton-Shunda B pools: Six new wells in the Brazeau area have resulted in an increase in the estimated reserves of the Brazeau River Elkton-Shunda A Pool of 70 Bcf to 260 Bcf and an increase in the estimated reserves of the Brazeau River Elkton-Shunda B Pool of 70 Bcf to 760 Bcf. The Board interprets the separation of the Shunda portion of the pools as occurring in approximately the same location as in the Elkton portion, while TransCanada separates the Shunda to the north.

Cessford Basal Colorado A Pool: The marketable gas reserves in the Cessford Basal Colorado A Pool have been decreased by 140 Bcf based on a material balance study of this pool. The result of the Board's material balance is close to that of TransCanada.

Crossfield East Wabamun A Pool: The Board used a material balance approach for its estimation of reserves in this pool. As a result of the material balance work, the estimate of reserves decreased by 110 Bcf to 500 Bcf. TransCanada's reserve estimate was based on a volumetric approach and disagrees with the result obtained by material balance.

Dunvegan Debolt A, Debolt B and Debolt C pools: As a result of the drilling activity in the new Dunvegan Field, several new reserves have been established and old reserves re-evaluated. The most significant reserve additions were in the newly designated Dunvegan Debolt A Pool, Dunvegan Debolt B Pool and Dunvegan Debolt C Pool, which collectively experienced a growth of 620 Bcf to 700 Bcf. Several wells have been drilled in the field since Alberta and Southern's estimate of the reserves of these pools of 748 Bcf was made.

Ghost Pine Upper Mannville Q Pool: The Ghost Pine Upper Mannville reserves were completely re-evaluated as a direct result of TransCanada's application. The Ghost Pine Upper Mannville Q Pool experienced the greatest net change in reserves, an increase of 75 Bcf to 95 Bcf.

Gold Creek Wabamun A Pool: Based upon a reinterpretation of the pool following the apparent watering-out of one well, the estimated reserves of the Gold Creek Wabamun A Pool have been decreased by 100 Bcf to 130 Bcf.

Jumping Pound West Rundle C Pool: A re-evaluation of the Jumping Pound West Rundle C Pool prompted by the TransCanada application resulted in a reserve increase of 100 Bcf to 300 Bcf for the estimated reserves of the pool. The principal difference between TransCanada's estimate and the Board's is in the estimated pore volume of the reservoir.

Pincher Creek Rundle A Pool: The Board used a production decline curve approach for its estimation of reserves in this pool. As a result of the production decline work, the estimate of reserves decreased by 160 Bcf to 380 Bcf. The TransCanada estimate is smaller than that of the Board. The difference between these estimates is due to the longer production life predicted by the Board.

Ricinus Cardium A Pool: Two new wells increased the estimated reserves in this pool from 140 Bcf to 220 Bcf. The TransCanada estimate is close to that of the Board.

Three Hills Creek Pekisko Pool: The gas reserves in the Three Hills Creek Pekisko Pool have been decreased by 70 Bcf based on a material balance study of this pool. Results of work done by the Board were close to those of the main operator of the pool.

The Board's estimates of established reserves of gas tabulated by fields and areas are presented in Table A-1. Within each field or area, pools designated by Board orders and having initial marketable reserves of 10 Bcf or more are shown separately. The reserves of the remaining pools in a field or area are grouped by geological formation. The table does not show separately fields or areas where the Board's estimate of initial marketable reserves is less than 10 billion cubic feet unless the reserve is supplying a market.

The sum of the reserves of other confidential pools or strata, and the sum of reserves in non-producing fields or areas having an initial marketable reserve of less than 10 billion cubic feet are shown at the end of the table. These reserves are also included in the provincial total.

TABLE A-1 - ESTABLISHED RESERVES OF GAS IN THE PROVINCE

1	2	3	4	5	6	7	8	9	10
POOL OR ZONE	INITIAL GAS IN PLACE BCF	POOL RECOVERY FRACTION	SURFACE LOSS FRACTION	INITIAL MARKETABLE GAS BCF	MARKETABLE GAS PRODUCED JUNE 30/71 BCF	REMAINING MARKETABLE GAS JUNE 30/71 BCF	GROSS HEATING VALUE BTU/CU FT.	REMAINING MARKETABLE GAS AT 1000 BTU BCF	AREA ACRES
1 ACHESON									
2 VIKING	5	0.75	0.05	4	3	1	1020*	1	
3 BLAIRMORE	11	0.85	0.10	8	1	7	1040	7	
4 BLAIRMORE ASSOC	19	0.85	0.10	14	6	8	1050	8	
5 BLAIRMORE SOLN	9	0.65	0.55	3	2	1	1050	1	
6									
7 C-3 A SOLN	76	0.74	0.55	25	9	16	1070*	17	
8									
9 ACHESON EAST									
10 BLAIRMORE	2	0.85	0.10	2		2	1050	2	
11 BLAIRMORE SOLN	10	0.30	0.50	2		2	1050	2	
12									
13 ADEN									
14 BOW ISLAND	4	0.85	0.05	4		4	1000	4	
15 BOW ISLAND ASSOC	1	0.85	0.05	1		1	1000	1	
16 BASAL COLORADO	6	0.85	0.05	5	2	3	1000	3	
17 JURASSIC	2	0.90	0.05	2	1	1	1040	1	
18									
19 RUNDLE A	34	0.80	0.13	24	9	15	1040	16	
20 RUNDLE (OTHER)	1	0.85	0.05	1	1	< 1	1040	< 1	
21									
22 ALDERSON									
23 MILK RIVER D	380	0.55	0.05	200	12	188	980*	184	134520
24 MILK RIVER (OTHER)	4	0.55	0.05	2		2	980*	2	
25 2WS A	500	0.70	0.05	330	30	300	970*	291	321500
26 BOW ISLAND	17	0.80	0.05	14	1	13	1000	13	
27									
28 BASAL COLORADO	13	0.85	0.05	10		10	1030	10	
29									
30 ALEXANDER									
31 BASAL QUARTZ A	140	0.85	0.03	120	113	7	1060*	7	
32 MANNVILLE (OTHER)	5	0.45	0.05	2	2	< 1	1060*	< 1	
33									
34 ALEXIS									
35 MANNVILLE	17	0.85	0.05	13		13	1040	14	
36 PANFF ASSOC	13	0.85	0.05	11		11	1060	12	
37									
38 ALIX									
39 MANNVILLE	10	0.90	0.05	8		8	1090*	9	
40 D-2 ASSOC	4	0.85	0.35	2		2	1130*	2	
41 D-2 SOLN	9	0.65	0.65	2		2	1130*	2	
42									
43 AMBER									
44 SLAVE POINT	3	0.90	0.15	2		2	1100	2	
45 SULPHUR POINT	3	0.90	0.20	2		2	1100*	2	
46 MUSKEG	6	0.90	0.25	4		4	1120*	4	
47 MUSKEG ASSOC	2	0.85	0.25	2		2	1120*	2	
48									
49 KEG RIVER	7	0.90	0.20	5		5	1200*	6	
50 KEG RIVER A ASSOC	14	0.90	0.15	11		11	1200*	13	160
51 KR ASSOC (OTHER)	41	0.90	0.15	31		31	1200*	37	
52 KEG RIVER SOLN	7	0.70	0.25	4		4	1200*	5	
53									
54 AMIGO									
55 SLAVE POINT	1	0.85	0.15	1		1	1050*	1	
56 SULPHUR PT 8-119-7	15	0.85	0.15	11		11	1050*	12	160
57 SULPHUR PT (OTHER)	5	0.85	0.15	4		4	1050*	4	
58 MUSKEG	3	0.90	0.15	3		3	1100*	3	
59									
60 KEG RIVER	16	0.85	0.35	9		9	1150*	10	
61 KEG RIVER ASSOC	15	0.85	0.15	11		11	1150*	13	
62									
63 ANTE CREEK									
64 PEACE RIVER	11	0.85	0.05	8		8	1100	9	

11	12	13	14	15	16	17	18	19	20
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AVERAGE PAY THICKNESS FEET	POROSITY FRACTION	LIQUID SATURATION FRACTION	INITIAL PRESSURE PSIA	RESERVOIR TEMPERATURE °F	COMPRESS- IBILITY FACTOR FRACTION	RAW GAS SPECIFIC GRAVITY	AVERAGE WELL DEPTH FEET	DISCOVERY YEAR	DATE LAST REVIEWED, DISPOSITION AND REMARKS
									1966 NUL 1967 NUL 1967 NUL 1966 NUL
							5080	1950	1971 NUL
									1967 1970 NUL
									1968 CMG 1968 1968 CMG 1968 CMG
			GIP BASED ON MATERIAL BALANCE				2840	1961	1969 CMG 1971 CMG
22	0.21	0.45	440	65	0.94	0.57	960	1941	1971 TCPL AND LOC U
5	0.20	0.40	830	80	0.90	0.58	1970	1956	1970 1967 TCPL 1964 TCPL 1965 LOC U
			GIP BASED ON MATERIAL BALANCE				3830	1954	1967 NCO AND CPL 1961 NCO AND CPL 1968 1969 1962 1969 1969 1969 1968 1968 1968 1968 1968 1968 1971
102	0.15	0.15	2240	160	0.84	0.70	5020	1968	
195	0.10	0.15	1990	150	0.87	0.68	5380	1969	1969 1969 1970 1969 1970 1968 1964

TABLE A-1 (CONTINUED) - ESTABLISHED RESERVES OF GAS IN THE PROVINCE

1	2	3	4	5	6	7	8	9	10
POOL OR ZONE	INITIAL GAS IN PLACE BCF	POOL RECOVERY FRACTION	SURFACE LOSS FRACTION	INITIAL MARKETABLE GAS BCF	MARKETABLE GAS PRODUCED JUNE 30/71 BCF	REMAINING MARKETABLE GAS JUNE 30/71 BCF	GROSS HEATING VALUE BTU/CU FT	REMAINING MARKETABLE GAS AT 1000 BTU BCF	AREA ACRES
1 ANTE CREEK (CONTINUED)									
2 GETHING 36-67-24	13	0.85	0.05	11		11	1100	12	500
3 GETHING (OTHER)	6	0.85	0.05	5		5	1100	6	
4 CADOMIN	7	0.85	0.05	6		6	1100	7	
5									
6 TRIASSIC	8	0.85	0.05	7		7	1140	8	
7 BEAVERHILL LAKE SOLN	70	0.60	0.20	33		33	1090	36	
8 BH LK SOLN (OTHER)	7	0.70	0.20	4		4	1090	4	
9									
10 ANTELOPE									
11 VIKING A	13	0.80	0.05	10	1	9	1020	9	4620
12 MANNVILLE	2	0.85	0.05	1		1	1010	1	
13 BANFF	12	0.80	0.05	9	6	3	1020	3	
14									
15 ASHMONT									
16 VIKING	3	0.75	0.05	2		2	1000	2	
17 MANNVILLE	7	0.80	0.05	5		5	1020	5	
18									
19 ATHABASCA									
20 MANNVILLE	6	0.85	0.05	5	2	3	1000	3	
21 WABAMUN	4	0.90	0.05	3		3	980	3	
22									
23 ATHABASCA EAST									
24 MANNVILLE	1	0.80	0.05	1		1	1090	1	
25 D-1	24	0.65	0.05	15	1	14	1000	14	5230
26									
27 ATIM									
28 MANNVILLE	1	0.85	0.05	1	1		1070*		
29									
30 ATLEE-BUFFALO									
31 MEDICINE HAT A	72	0.80	0.05	55	8	47	980*	46	75280
32 VIKING A	35	0.75	0.04	25	14	11	980*	11	
33 VIKING B	29	0.75	0.05	21	1	20	980*	20	17310
34 VIKING (OTHER)	9	0.80	0.05	7		7	980*	7	
35									
36 BASAL COLORADO	6	0.80	0.05	5		5	1020	5	
37 MANNVILLE	6	0.80	0.05	5		5	960	5	
38									
39 ATMORE									
40 MCMURRAY A	19	0.75	0.05	13		13	1020	13	13400
41 MANNVILLE (OTHER)	9	0.75	0.05	6		6	960	6	
42 NISKU	3	0.80	0.05	2		2	990	2	
43									
44 BANTRY									
45 MILK RIVER A	52	0.55	0.05	27	1	26	960	25	31200
46 MILK RIVER (OTHER)	8	0.55	0.05	4		4	960	4	
47 2WS	1	0.80	0.05	1		1	970	1	
48 VIKING	25	0.85	0.05	20		20	970	19	
49									
50 BASAL COLORADO	3	0.85	0.05	3	1	2	1010*	2	
51 MANNVILLE	14	0.85	0.05	11	2	9	1030	9	
52 MANNVILLE A ASSOC	27	0.85	0.05	22		22	1080*	24	5040
53 MANN ASSOC (OTHER)	19	0.85	0.05	15		15	1080*	16	
54 MANNVILLE A SOLN	49	0.60	0.35	19	1	18	1080*	19	
55									
56 BAPTISTE									
57 MANNVILLE	6	0.80	0.05	5		5	970	5	
58 WABAMUN A	15	0.80	0.05	11		11	980	11	3840
59									
60 BASHAW									
61 VIKING	5	0.80	0.05	4		4	970	4	
62 MANNVILLE	19	0.85	0.05	16		16	1000	16	
63 MANNVILLE ASSOC	13	0.80	0.05	10		10	1030*	10	
64 D-3 A ASSOC	16	0.80	0.15	11		11	1100*	12	2740

OF ALBERTA, JUNE 30, 1971 (14.65 PSIA AND 60°F.)

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AVERAGE PAY THICKNESS FEET	POROSITY FRACTION	LIQUID SATURATION FRACTION	INITIAL PRESSURE PSIA	RESERVOIR TEMPERATURE °F	COMPRESS- IBILITY FACTOR FRACTION	RAW GAS SPECIFIC GRAVITY	AVERAGE WELL DEPTH FEET	DISCOVERY YEAR	DATE LAST REVIEWED, DISPOSITION AND REMARKS
35	0.15	0.30	2200	125	0.83	0.62	5690	1961	1967 1967 1967
							11270	1963	1970 1970 1970
8	0.22	0.50	950	80	0.88	0.59	2360	1957	1967 TCPL 1970 1967 TCPL
									1956 1956 LOC U
									1957 LOC U 1957
36	0.12	0.40	600	85	0.93	0.57	2030	1950	1957 1970 LOC U
									1963 POOL ABANDONED
3	0.26	0.40	640	65	0.91	0.57	1640	1960	1970 TCPL
		GIP BASED ON MATERIAL BALANCE					2600	1949	1970 TCPL
4	0.25	0.50	1010	80	0.87	0.60	2320	1954	1967 TCPL 1967
									1967 TCPL 1971 TCPL
7	0.30	0.45	390	75	0.95	0.57	1670	1958	1970 1968 1970
15	0.20	0.45	400	55	0.94	0.57	960	1940	1970 LOC U 1970 1967 1965
									1964 CWNG 1961 TCPL
5	0.27	0.30	1560	85	0.79	0.73	3210	1948	1969 1968
							3250	1948	1969 TCPL
23	0.15	0.30	510	70	0.93	0.57	1920	1959	1968 BER 1968 BER
									1963 1966 1966
17	0.05	0.15	2330	140	0.85	0.78	5760	1951	1966

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TABLE A-1 (CONTINUED) - ESTABLISHED RESERVES OF GAS IN THE PROVINCE

1	2	3	4	5	6	7	8	9	10
POOL OR ZONE	INITIAL GAS IN PLACE BCF	POOL RECOVERY FRACTION	SURFACE LOSS FRACTION	INITIAL MARKETABLE GAS BCF	MARKETABLE GAS PRODUCED JUNE 30/71 BCF	REMAINING MARKETABLE GAS JUNE 30/71 BCF	GROSS HEATING VALUE BTU/CU FT.	REMAINING MARKETABLE GAS AT 1000 BTU BCF	AREA ACRES
1 BASHAW (CONTINUED)									
2 C-3 ASSCC (OTHER)	2	0.80	0.15	1		1	1100*	1	
3									
4 BASSANO									
5 BOW ISLAND	3	0.85	0.05	2		2	1010*	2	
6 BASAL COLORADO	8	0.80	0.05	6	1	5	1010*	5	
7 MANNVILLE C	15	0.85	0.05	12		12	1020*	12	2580
8 MANNVILLE (OTHER)	3	0.85	0.05	2		2	1020*	2	
9									
10 BEAVER CROSSING									
11 MANNVILLE	1	0.70	0.05	1		1	1000	1	
12									
13 BH LK-FT SASK									
14 VIKING	610	0.85	0.05	490	187	303	1010*	306	
15 VIKING (OTHER)	7	0.85	0.05	6		6	1010*	6	
16 MANNVILLE	4	0.85	0.05	3		3	1010	3	
17									
18 BELLIS									
19 VIKING A	14	0.80	0.05	11		11	960	11	8080
20 MANNVILLE	28	0.75	0.05	20	3	17	1015	17	
21 NISKU A	43	0.85	0.05	35	1	34	1000	34	14750
22 NISKU (OTHER)	1	0.70	0.05	1		1	1000	1	
23									
24 BELLOY									
25 PEACE RIVER	3	0.80	0.05	2		2	980	2	
26 SPIRIT RIVER	13	0.75	0.05	9		9	980	9	
27 BLUESKY	2	0.85	0.05	2		2	1000	2	
28 GETHING A	37	0.85	0.05	30		30	980	29	5430
29									
30 GETHING (OTHER)	6	0.85	0.05	5		5	980	5	
31 CADOMIN	2	0.85	0.05	2		2	990	2	
32 TRIASSIC	5	0.85	0.05	4		4	1020	4	
33 PERMIAN	1	0.85	0.05	1		1	1050	1	
34 RUNDLE	22	0.85	0.05	18		18	1050	19	
35									
36 BENJAMIN									
37 RUNDLE A	120	0.80	0.15	80		80	1070	86	2610
38 RUNDLE B	88	0.80	0.15	60		60	1070	64	2490
39									
40 BERLAND RIVER									
41 WABAMUN 23-57-24	18	0.80	0.10	13		13	1020	13	125
42 WABAMUN 10-58-24	15	0.85	0.10	11		11	1020	11	1100
43 LEDUC A	440	0.90	0.25	300		300	990	297	1100
44 LEDUC (OTHER)	3	0.90	0.05	2		2	990	2	
45									
46 BERLAND RIVER WEST									
47 WABAMUN 10-58-25	24	0.90	0.30	15		15	1020	15	1100
48									
49 BERRY									
50 VIKING	1	0.85	0.05	1		1	1020	1	
51 MANNVILLE	3	0.85	0.05	3		3	1030	3	
52 MANNVILLE ASSOC	5	0.85	0.15	4	1	3	1030	3	
53									
54 BIG BEND									
55 WABISKAW 31-68-1	12	0.90	0.05	10		10	990	10	1100
56 MCMURRAY B	15	0.75	0.05	11		11	990	11	4130
57 MCMURRAY H	16	0.75	0.05	12		12	990	12	3560
58 MANNVILLE (OTHER)	42	0.80	0.05	31		31	990	31	
59									
60 WABAMUN A	45	0.75	0.05	32		32	1000	32	5300
61 WABAMUN (OTHER)	11	0.75	0.10	8		8	1000	8	
62									
63 BIGORAY									
64 PASKAPOO	2	0.60	0.05	1		1	970	1	

11	12	13	14	15	16	17	18	19	20
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TABLE A-1 (CONTINUED) - ESTABLISHED RESERVES OF GAS IN THE PROVINCE

1	2	3	4	5	6	7	8	9	10
POOL OR ZONE	INITIAL GAS IN PLACE BCF	POOL RECOVERY FRACTION	SURFACE LOSS FRACTION	INITIAL MARKETABLE GAS BCF	MARKETABLE GAS PRODUCED JUNE 30/71 BCF	REMAINING MARKETABLE GAS JUNE 30/71 BCF	GROSS HEATING VALUE BTU/CU FT.	REMAINING MARKETABLE GAS AT 1000 BTU BCF	AREA ACRES
1 BIGORAY (CONTINUED)									
2 MANNVILLE	17	0.80	0.05	13		13	1130	15	
3 JURASSIC	8	0.85	0.05	7		7	1050*	7	
4 PEKISCOC A	35	0.85	0.10	27		27	1090	29	7170
5									
6 RUNDLE (OTHER)	7	0.85	0.10	6		6	1090	7	
7									
8 BIGSTONE									
9 DUNVEGAN A	52	0.90	0.05	45		45	1140	51	6390
10 GETHING A	13	0.90	0.05	11		11	1100	12	1100
11 GETHING (OTHER)	11	0.90	0.05	9		9	1100	10	
12 WABAMUN	11	0.85	0.40	5		5	1050	5	
13									
14 D-3 A	390	0.85	0.25	250	30	220	980*	216	7100
15									
16 RINDLOSS									
17 VIKING A	400	0.75	0.01	300	150	150	990*	149	
18 VIKING B	32	0.70	0.05	21	2	19	990*	19	6110
19 VIKING (OTHER)	6	0.75	0.05	5		5	990*	5	
20 BASAL MANNVILLE A	25	0.90	0.05	22		22	990	22	5310
21									
22 BIRCH									
23 MANNVILLE	9	0.85	0.05	8		8	1000	8	
24 WINTERBURN	2	0.85	0.05	2		2	990*	2	
25 CAMROSE	6	0.80	0.05	5		5	990*	5	
26									
27 BITTERN LAKE									
28 VIKING	8	0.80	0.05	6		6	1020	6	
29 GLAUCONITIC A	66	0.85	0.05	50	15	35	1070	37	
30 GLAUCONITIC B	21	0.85	0.05	17	5	12	1070	13	1210
31 ELLERSLIE A	14	0.85	0.05	12		12	1070	13	2370
32									
33 MANNVILLE (OTHER)	34	0.85	0.05	27	1	26	1070	28	
34 MANNVILLE ASSOC.	1	0.80	0.05	1		1	1070	1	
35									
36 BLACK									
37 SLAVE POINT	15	0.90	0.15	11		11	1100	12	
38 SULPHUR POINT ASSOC	1	0.85	0.15	1		1	1100	1	
39 MUSKEG	1	0.85	0.10	1		1	1100	1	
40 KEG RIVER	5	0.85	0.15	4		4	1150	5	
41									
42 KEG RIVER ASSOC	4	0.85	0.15	3		3	1200	4	
43 KEG RIVER A SOLN	21	0.75	0.15	13		13	1200	16	
44									
45 BLACK BUTTE									
46 ZWS	2	0.80	0.05	1		1	960	1	
47 BOW ISLAND	9	0.85	0.05	7	3	4	980	4	
48 BASAL COLORADO A	15	0.85	0.05	12	4	8	1000	8	2840
49 BSL COLORADO (OTHER)	10	0.85	0.05	8	6	2	1000	2	
50									
51 MANNVILLE (OTHER)	7	0.85	0.05	5		5	1030	5	
52 SUNBURST-SWIFT A	14	0.90	0.04	12	10	2	1000	2	
53 SAWTOOTH A	28	0.80	0.05	21	19	2	1000	2	
54 RUNDLE A	16	0.80	0.05	12	7	5	1020	5	2750
55									
56 BLACK DIAMOND									
57 RUNDLE A	24	0.85	0.15	17		17	1100	19	500
58									
59 BLUERIDGE									
60 MANNVILLE	3	0.80	0.05	2		2	1100	2	
61 JURASSIC A	14	0.90	0.05	12		12	1100	13	500
62 JURASSIC (OTHER)	11	0.80	0.10	9	2	7	1100	8	
63 RUNDLE	2	0.70	0.05	2		2	1130	2	

OF ALBERTA, JUNE 30, 1971 (14.65 PSIA AND 60°F.)

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AVERAGE PAY THICKNESS FEET	POROSITY FRACTION	LIQUID SATURATION FRACTION	INITIAL PRESSURE PSIA	RESERVOIR TEMPERATURE °F	COMPRESS- IBILITY FACTOR FRACTION	RAW GAS SPECIFIC GRAVITY	AVERAGE WELL DEPTH FEET	DISCOVERY YEAR	DATE LAST REVIEWED, DISPOSITION AND REMARKS
17	0.08	0.50	2220	145	0.80	0.72	6210	1966	1969 A&S 1970 1971
16	0.15	0.45	2600	145	0.79	0.69	6480	1959	1966
20	0.14	0.30	2500	215	0.89	0.66	7780	1960	1961 1961 1964
105	0.07	0.15	4800	240	0.97	0.69	11080	1960	1964 TCPL
10	0.29	GIP BASED ON MATERIAL BALANCE					2250	1952	1969 TCPL
		0.45	1000	80	0.88	0.59	2530	1957	1967 TCPL
7	0.23	0.40	1470	85	0.85	0.59	2770	1954	1967
									1962
									1962
									1969
29	0.24	GIP BASED ON MATERIAL BALANCE					4010	1956	1967
11	0.19	0.40	1370	115	0.85	0.64	4180	1947	1971 CIGOL, PWGE, AND NUL
		0.35	1350	115	0.83	0.68	4140	1952	1967 CIGOL, PWGE, AND NUL
									1967
									1967 CIGOL, PWGE, AND NUL
									1969
									1967
									1967
									1967
									1967
							6550	1967	1967
									1970
15	0.20	0.40	930	80	0.89	0.58	2540	1944	1961 CMG 1969 CMG 1968 CMG 1968 CMG
									1963 CMG
							2950	1944	1971 CMG
18	0.10	0.20	1200	90	0.87	0.58	3200	1944	1967 CMG
							3280	1944	1968 CMG
59	0.10	0.15	3630	195	0.87	0.74	9020	1967	1967
26	0.28	0.30	1800	150	0.85	0.66	5500	1957	1964 1966 TCPL 1971 TCPL 1968

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TABLE A-1 (CONTINUED). - ESTABLISHED RESERVES OF GAS IN THE PROVINCE

1	2	3	4	5	6	7	8	9	10
POOL OR ZONE	INITIAL GAS IN PLACE BCF	POOL RECOVERY FRACTION	SURFACE LOSS FRACTION	INITIAL MARKETABLE GAS BCF	MARKETABLE GAS PRODUCED JUNE 30/71 BCF	REMAINING MARKETABLE GAS JUNE 30/71 BCF	GROSS HEATING VALUE BTU/CU FT	REMAINING MARKETABLE GAS AT 1000 BTU BCF	AREA ACRES
1 BLUERIDGE (CONTINUED)									
2 PEKISKO A ASSOC	13	0.80	0.05	10	1	9	1130	10	2420
3									
4 BELLOQUE LAKE									
5 VIKING	2	0.80	0.05	1		1	1060	1	
6 MANNVILLE	13	0.80	0.05	10		10	990	10	
7									
8 BONNIE GLEN									
9 CARDIUM SOLN	6	0.65	0.10	3		3	1040*	3	
10 VIKING	2	0.85	0.10	2		2	1050	2	
11 MANNVILLE	4	0.85	0.10	3	3	< 1	1100*	< 1	
12 WABAMUN	1	0.85	0.10	1		1	1100*	1	
13									
14 WINTERBURN	1	0.85	0.10	1		1	1100*	1	
15 C-3	14	0.70	0.15	9	7	2	1100*	2	
16 C-3 A ASSOC	430	0.85	0.15	310	-4	314	1220*	383	2990
17 C-3 A SOLN	540	0.70	0.25	280	75	205	1220*	250	
18									
19 MCNNYVILLE									
20 MANNVILLE	5	0.80	0.05	4	3	1	980	1	
21									
22 BOUNDARY LAKE SOUTH									
23 CADOMIN	11	0.80	0.10	8		8	1060	8	
24 TRIASSIC 14-86-12	25	0.85	0.05	20		20	1050	21	6510
25 TRIASSIC (OTHER)	2	0.80	0.05	1		1	1050	1	
26 TRIASSIC ASSOC	5	0.90	0.05	4		4	1050	4	
27									
28 KISKATINAW D	37	0.85	0.08	29	15	14	1080	15	
29 KISKATINAW (OTHER)	11	0.85	0.05	9	4	5	1080	5	
30 GCLATA B	42	0.85	0.05	34	12	22	1080	24	
31 GCLATA (CTHER)	10	0.85	0.05	8	8		1080		
32									
33 POW ISLAND									
34 POW ISLAND	48	0.90	0.05	40	15	25	1040*	26	
35									
36									
37 BOYLE									
38 MANNVILLE	3	0.80	0.05	2		2	1000	2	
39 NISKU	8	0.85	0.05	7	1	6	990	6	
40									
41 DRAEBURN									
42 CADOMIN	1	0.80	0.05	1	1		1060*		
43 TRIASSIC	12	0.50	0.10	5	5		1090*		
44 PERMIAN	19	0.15	0.05	3	3		1030*		
45									
46 PRAZEAU RIVER									
47 ELKTON-SHUNDA A	350	0.80	0.10	260	21	239	1040*	249	15610
48 ELKTON-SHUNDA B	1050	0.80	0.10	760	51	709	1050*	744	59530
49 SHUNDA	9	0.85	0.10	7		7	1080*	8	
50									
51 BROOKS									
52 MILK RIVER	9	0.80	0.05	7	4	3	990	3	
53									
54 BROWN CREEK									
55 RUNDLE 20-44-17	59	0.80	0.15	40		40	970	39	1370
56									
57 BRUCF									
58 VIKING A	36	0.75	0.05	26		26	1000	26	44190
59 VIKING (OTHER)	5	0.80	0.05	4		4	1000	4	
60 MANNVILLE	8	0.80	0.05	6		6	1020	6	
61									
62 BURNT TIMBER									
63 RUNDLF A	440	0.80	0.20	280	6	274	1040*	285	10360

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AVERAGE PAY THICKNESS FEET	POROSITY FRACTION	LIQUID SATURATION FRACTION	INITIAL PRESSURE PSIA	RESERVOIR TEMPERATURE °F	COMPRESS- IBILITY FACTOR FRACTION	RAW GAS SPECIFIC GRAVITY	AVERAGE WELL DEPTH FEET	DISCOVERY YEAR	DATE LAST REVIEWED, DISPOSITION AND REMARKS
12	0.13	0.35	1820	150	0.84	0.66	5680	1967	1971 TCPL
									1966
									1967
									1969
									1963
									1964 NUL
									1967
216	0.09	0.10	2440	140	0.79	0.70	6700	1952	1967 NUL
							7000	1952	1966 GAS STORAGE
									1966 NUL
									1964 LOC U
8	0.13	0.25	1640	140	0.85	0.65	4320	1967	1964
									1971
									1969
									1971
		GIP BASED ON MATERIAL BALANCE					6220	1964	1969 WCOAST
		GIP BASED ON MATERIAL BALANCE					6100	1964	1966 WCOAST
									1970 WCOAST
									1970 POOL ABANDONED
		RESERVE BASED ON PRODUCTION & INJECTION DATA					1920	1909	1953 CWNG STORAGE RESERVOIR
									1966
									1966 TCPL
									1969 POOL ABANDONED
									1971 POOL ABANDONED
									1970 POOL ABANDONED
32	0.09	0.15	3860	210	0.94	0.67	9690	1965	1971 A&S AND TCPL
22	0.10	0.15	3870	215	0.95	0.67	9950	1959	1971 A&S AND TCPL
									1971
									1961 LOC U
129	0.04	0.20	4550	115	0.98	0.64	10840	1960	1964
3	0.20	0.45	805	85	0.90	0.60	2610	1952	1971
									1967
									1967
109	0.06	0.20	3860	200	0.91	0.72	10590	1959	1971 TCPL

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TABLE A-1 (CONTINUED) - ESTABLISHED RESERVES OF GAS IN THE PROVINCE

1	2	3	4	5	6	7	8	9	10
POOL OR ZONE	INITIAL GAS IN PLACE BCF	POOL RECOVERY FRACTION	SURFACE LOSS FRACTION	INITIAL MARKETABLE GAS BCF	MARKETABLE GAS PRODUCED JUNE 30/71 BCF	REMAINING MARKETABLE GAS JUNE 30/71 BCF	GROSS HEATING VALUE BTU/CU. FT.	REMAINING MARKETABLE GAS AT 1000 BTU BCF	AREA ACRES
1 CALAIS									
2 GETHING	8	0.85	0.05	6	1	5	1000	5	
3 CADOMIN	7	0.85	0.05	5		5	1000	5	
4									
5 CALLING LAKE									
6 MANNVILLE	2	0.75	0.05	2		2	1000	2	
7 D-2	16	0.75	0.05	11	5	6	1000	6	
8									
9 CAMPBELL-NAMAC									
10 BLAIRMORE	3	0.85	0.05	3		3	1020	3	
11 BLAIRMORE E ASSOC	31	0.80	0.05	23**					1740
12 BLAIR ASSOC (OTHER)	13	0.80	0.05	10**					
13 BLAIRMORE SOLN	4	0.60	0.10	2**	25**	10	1020*	10	
14									
15 CARBON									
16 BASAL COLORADO	4	0.85	0.05	3		3	1020	3	
17 GLAUCONITIC	140	0.85	0.10	110	42	68	1120	76	
18 RUNDLE	3	0.85	0.05	3		3	1110	3	
19									
20 CAROLINE									
21 VIKING	2	0.80	0.05	1		1	1050*	1	
22 VIKING A ASSOC	160	0.80	0.05	120	13	107	1050*	112	40600
23 BASAL MANNVILLE B	15	0.85	0.10	12	3	9	1200	11	500
24 BASAL MANNVILLE C	16	0.85	0.10	12		12	1200	14	500
25									
26 MANNVILLE (OTHER)	25	0.90	0.10	20	1	19	1040*	20	
27 RUNDLE	15	0.85	0.15	10	1	9	1020*	9	
28									
29 CARSON CREEK									
30 BEAVERHILL LAKE A	210	0.85	0.15	150	21	129	1070*	138	20390
31 BEAVERHILL LAKE B	110	0.85	0.15	80	-7	87	1070*	93	6980
32									
33									
34 CARSON CREEK NORTH									
35 BH LK A ASSOC	24	0.85	0.15	17**					2770
36 BH LK A SOLN	120	0.46	0.20	43**	9**	51	1070*	55	
37 BH LK ASSOC (OTHER)	7	0.85	0.15	5		5	1070*	5	
38 BH LK B SOLN	360	0.47	0.20	140	17	123	1070*	132	
39									
40 CARSTAIRS									
41 BLAIRMORE	16	0.85	0.15	11		11	1100	12	
42 ELKTON A	1090	0.90	0.15	830	334	496	1080*	536	
43									
44 RUNDLE ASSOC	6	0.85	0.15	5		5	1070*	5	
45									
46 CASTOR									
47 VIKING A	33	0.80	0.05	25	1	24	1040	25	20320
48 MANNVILLE A	16	0.80	0.05	12	4	8	1090	9	5300
49 MANNVILLE (OTHER)	2	0.85	0.05	1		1	1090	1	
50									
51 CESSFORD									
52 VIKING H	16	0.75	0.03	11	1	10	1020*	10	6460
53 VIKING I	14	0.75	0.03	10		10	1020*	10	6370
54 VIKING (OTHER)	64	0.75	0.03	46	12	34	1060*	36	
55 BASAL COLORADO E	130	0.80	0.05	100	52	48	1030*	49	23400
56									
57 BSL COLORADO (OTHER)	51	0.70	0.04	33	3	30	1030*	31	
58 BSL COLORADO A ASSOC	720	0.85	0.04	590**					
59 BSL COLORADO A SOLN	20	0.65	0.21	10**	402**	198	1030*	204	
60 MANNVILLE G	40	0.70	0.04	27	23	4	1000*	4	
61 MANNVILLE H	76	0.85	0.04	62	30	32	1000*	32	
62									
63 MANNVILLE I	13	0.75	0.04	10	6	4	1000*	4	
64 MANNVILLE J	22	0.72	0.04	16	15	1	1000*	1	

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AVERAGE PAY THICKNESS FEET	POROSITY FRACTION	LIQUID SATURATION FRACTION	INITIAL PRESSURE PSIA	RESERVOIR TEMPERATURE °F	COMPRESS- IBILITY FACTOR FRACTION	RAW GAS SPECIFIC GRAVITY	AVERAGE WELL DEPTH FEET	DISCOVERY YEAR	DATE LAST REVIEWED, DISPOSITION AND REMARKS
									1967 LOC U 1964
									1971 GCOS 1971 GCOS
30	0.19	0.20	1220	115	0.85	0.67	3620	1951	1964 1969 1969 1964 CIGOL
GIP BASED ON MATERIAL BALANCE							4740	1953	1964 1970 CWNG 1965
7	0.11	0.25	2500	165	0.83	0.67	7860	1957	1967
26	0.15	0.30	4260	185	0.92	0.78	9460	1958	1967 TCPL 1964 A&S
27	0.15	0.30	4040	180	0.89	0.78	8900	1964	1965
									1965 TCPL 1965 A&S
17	0.08	0.20	3790	200	0.85	0.97	8560	1961	1964 POOLS BEING CYCLED
24	0.08	0.20	3790	200	0.85	0.97	8620	1957	1964 AND GAS SOLD TO NUL AND A&S
10	0.09	0.10	3740	185	0.84	0.71	8580	1958	1970
							8630	1958	1971 INJ INTO CARSON CRK
								1969	
							8740	1958	1971 INJ INTO CARSON CRK
GIP BASED ON MATERIAL BALANCE							8080	1958	1967 1970 TCPL AND PARTIAL CYCLING SCHEME 1967
6	0.21	0.55	860	90	0.89	0.61	3160	1949	1969 TCPL
6	0.20	0.65	1130	90	0.85	0.63	3500	1949	1969 LOC U 1969
6	0.21	0.45	1110	75	0.86	0.59	2630	1953	1968 TCPL
8	0.21	0.45	1100	80	0.86	0.59	2730	1953	1968
									1968 TCPL
9	0.24	0.40	1260	85	0.84	0.62	2970	1950	1970 TCPL
GIP BASED ON MATERIAL BALANCE							2860	1950	1968 TCPL
GIP BASED ON MATERIAL BALANCE							2870	1950	1971
GIP BASED ON MATERIAL BALANCE							3390	1950	1968 TCPL
GIP BASED ON MATERIAL BALANCE							3070	1958	1971 TCPL
GIP BASED ON MATERIAL BALANCE									1970 TCPL
GIP BASED ON MATERIAL BALANCE							3340	1951	1970 TCPL
GIP BASED ON MATERIAL BALANCE							3400	1958	1971 TCPL

TABLE A-1 (CONTINUED) - ESTABLISHED RESERVES OF GAS IN THE PROVINCE

1	2	3	4	5	6	7	8	9	10
POOL OR ZONE	INITIAL GAS IN PLACE BCF	POOL RECOVERY FRACTION	SURFACE LOSS FRACTION	INITIAL MARKETABLE GAS BCF	MARKETABLE GAS PRODUCED JUNE 30/71 BCF	REMAINING MARKETABLE GAS JUNE 30/71 BCF	GROSS HEATING VALUE BTU/CU. FT.	REMAINING MARKETABLE GAS AT 1000 BTU BCF	AREA ACRES
1 CESSFORD (CONTINUED)									
2 MANNVILLE L	12	0.85	0.04	10	4	6	1000*	6	
3 MANNVILLE V	27	0.80	0.04	20	14	6	1000*	6	
4 MANNVILLE (OTHER)	101	0.75	0.04	71	21	50	1000*	50	
5									
6 MANNVILLE C ASSOC	19	0.85	0.04	16		16	1030*	16	3930
7 MANN ASSOC (OTHER)	1	0.85	0.04	1	1	< 1	1030*	< 1	
8 MANNVILLE SOLN	12	0.65	0.17	7	7	< 1	1000*	< 1	
9									
10 CHAMBERS									
11 MANNVILLE	6	0.85	0.10	4		4	1030	4	
12 RUNDLE	13	0.85	0.15	9		9	1080	10	
13									
14 CHARLOTTE LAKE									
15 MANNVILLE	2	0.75	0.05	1		1	1000	1	
16									
17 CHERHILL									
18 VIKING	6	0.80	0.05	4		4	1060	4	
19 MANNVILLE	16	0.85	0.10	13		13	1040	14	
20 BANFF ASSOC	9	0.85	0.10	7		7	1060	7	
21									
22 CHESTERMERE									
23 RUNDLE A	27	0.85	0.15	20		20	1100	22	1000
24 WABAMUN 13-22-29	38	0.80	0.55	14		14	990	14	1100
25									
26 CHIGWELL									
27 MANNVILLE A	46	0.85	0.10	35	17	18	1130*	20	
28 MANNVILLE (OTHER)	9	0.80	0.10	6	1	5	1130*	6	
29									
30 CHINOOK RIDGE									
31 CADOTTE 12-65-13	32	0.80	0.10	23		23	1020	23	1100
32 PEACE RIVER (OTHER)	13	0.80	0.10	9		9	1020	9	
33 SPIRIT R 12-65-13	20	0.80	0.10	15		15	1020	15	500
34									
35 CLIVE									
36 VIKING	4	0.80	0.05	3		3	990	3	
37 MANNVILLE	5	0.85	0.05	4		4	1020	4	
38 D-2 A ASSOC	39	0.85	0.30	23		23	1050*	24	4570
39 D-2 ASSOC (OTHER)	1	0.85	0.30	1		1	1050*	1	
40									
41 D-2 SOLN	41	0.47	0.60	8	3	5	1050*	5	
42 D-3 A ASSOC	33	0.85	0.35	18		18	1050*	19	3950
43 D-3 A SOLN	70	0.56	0.65	14	6	8	1050*	8	
44									
45 COLD LAKE									
46 CCLONY A	22	0.70	0.05	14	4	10	1000	10	
47 MANNVILLE (OTHER)	3	0.75	0.05	2	1	1	1000	1	
48									
49 COMREY									
50 ZWS	5	0.80	0.05	4		4	940	4	
51 BOW ISLAND	25	0.80	0.03	20	17	3	940	3	
52 BOW ISLAND (OTHER)	1	0.80	0.05	1		1	940	1	
53 UPPER MANNVILLE A	16	0.90	0.05	14		14	1000	14	1100
54									
55 JURASSIC	1	0.80	0.05	1		1	1000	1	
56									
57 CONNORSVILLE									
58 VIKING	9	0.80	0.05	7	4	3	1000	3	
59 LOWER MANNVILLE A	52	0.85	0.05	42	4	38	1100	42	10110
60 MANNVILLE (OTHER)	12	0.85	0.05	10	2	8	1100	9	
61									
62 COUNTESS									
63 BOW ISLAND A	34	0.80	0.04	26	6	20	1010*	20	
64 BOW ISLAND C	19	0.80	0.05	14	1	13	1010*	13	6090

OF ALBERTA, JUNE 30, 1971 (14.65 PSIA AND 60°F.)

11 12 13 14 15 16 17 18 19 20

AVERAGE PAY THICKNESS FEET	POROSITY FRACTION	LIQUID SATURATION FRACTION	INITIAL PRESSURE PSIA	RESERVOIR TEMPERATURE °F	COMPRESS- IBILITY FACTOR FRACTION	RAW GAS SPECIFIC GRAVITY	AVERAGE WELL DEPTH FEET	DISCOVERY YEAR	DATE LAST REVIEWED, DISPOSITION AND REMARKS
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GIP BASED ON MATERIAL BALANCE
GIP BASED ON MATERIAL BALANCE3630 1962 1971 TCPL
3800 1959 1969 TCPL
1968 TCPL

6	0.24	0.35	1400	90	0.81	0.65	3320	1951	1968 1971 TCPL 1968 TCPL
									1967 1967
									1965 CFB, COLD LAKE
									1968 1968 1968

37	0.10	0.15	2790	155	0.80	0.76	6820	1968	1969
61	0.06	0.20	3600	175	0.70	0.90	8410	1969	1970

GIP BASED ON MATERIAL BALANCE

5140 1952 1968 TCPL
1968 TCPL

23	0.20	0.30	3300	230	0.85	0.80	9200	1956	1961 BER 1961 BER
32	0.20	0.30	3400	235	0.86	0.80	9460	1956	1961 BER

19	0.06	0.15	2480	150	0.73	0.75	6040	1951	1966 1966 1968 1968
20	0.06	0.15	2550	150	0.73	0.81	6140 6150	1952 1952	1970 TCPL 1968 1970 TCPL

GIP BASED ON MATERIAL BALANCE

900 1952 1970 LOC U
1966 LOC U

GIP BASED ON MATERIAL BALANCE

2480 1952 1960
1970 CMG
1960
1968 CMG
1960

33	0.21	0.35	990	80	0.88	0.57	2750	1968	1968 CMG
11	0.16	0.35	1410	105	0.85	0.61	3650	1956	1964 TCPL 1965 TCPL 1965 TCPL

GIP BASED ON MATERIAL BALANCE

2890 1951 1970 TCPL
2860 1955 1968 TCPL

8	0.22	0.50	1040	85	0.87	0.60			
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TABLE A-1 (CONTINUED) - ESTABLISHED RESERVES OF GAS IN THE PROVINCE

1	2	3	4	5	6	7	8	9	10
POOL OR ZONE	INITIAL GAS IN PLACE BCF	POOL RECOVERY FRACTION	SURFACE LOSS FRACTION	INITIAL MARKETABLE GAS BCF	MARKETABLE GAS PRODUCED JUNE 30/71 BCF	REMAINING MARKETABLE GAS JUNE 30/71 BCF	GROSS HEATING VALUE BTU/CU FT	REMAINING MARKETABLE GAS AT 1000 BTU BCF	AREA ACRES
1 CCUNTESS (CONTINUED)									
2 BCW ISLAND F	15	0.85	0.05	12	1	11	1010*	11	2230
3 BCW ISLAND (OTHER)	30	0.75	0.05	22	2	20	1010*	20	
4									
5 BASAL COLORADO A	170	0.85	0.05	140	94	46	1010*	46	
6 MANNVILLE	48	0.85	0.05	38	8	30	1020*	31	
7 BASAL QUARTZ B ASSOC	12	0.85	0.05	10		10	1020*	10	1370
8 MANN ASSOC (OTHER)	5	0.85	0.05	4		4	1020*	4	
9 MISS ASSOC	3	0.80	0.10	2		2	1030*	2	
10									
11 CRAIGEND									
12 PELICAN	3	0.75	0.05	2		2	1000	2	
13 GRAND RAPIDS C	18	0.65	0.05	11		11	1000	11	12150
14 GRAND RAPIDS F	19	0.65	0.05	12		12	1000	12	10120
15 WABISKAW B	15	0.75	0.05	10		10	1000	10	10670
16									
17 MCMURRAY B	24	0.70	0.05	16		16	1000	16	11470
18 MANNVILLE (OTHER)	66	0.75	0.05	47	1	46	1000	46	
19 MANNVILLE ASSOC	1	0.75	0.05	1		1	1000	1	
20 GRCSMONT A	200	0.75	0.05	140	10	130	1000	130	87050
21									
22 CRAIG LAKE									
23 VIKING	1	0.75	0.05	1		1	1000	1	
24									
25 CROSSFIELD									
26 BELLY RIVER	2	0.75	0.05	2		2	1000*	2	
27 CARDIUM SOLN	75	0.15	0.45	6	1	5	1140*	6	
28 BASAL QUARTZ A	63	0.85	0.10	48	4	44	1020*	45	8940
29 BLAIRMORE (OTHER)	35	0.85	0.10	27	4	23	1020*	23	
30									
31 RUNDLE A	1240	0.90	0.10	1000	273	727	1060*	771	
32 RUNDLE B	940	0.85	0.15	680	292	388	1070*	415	21390
33 RUNDLE D	13	0.85	0.10	10		10	1020*	10	500
34 WABAMUN A	1600	0.75	0.50	600	158	442	980	433	
35									
36 CROSSFIELD EAST									
37 BASAL QUARTZ A	13	0.85	0.10	10		10	1020*	10	1830
38 BLAIRMORE (OTHER)	1	0.85	0.10	1		1	1020*	1	
39 ELKTON A	150	0.90	0.12	120	56	64	1140*	73	
40 ELKTON C	32	0.85	0.10	24	2	22	1140*	25	1100
41									
42 WABAMUN A	1280	0.85	0.54	500	61	439	970	426	
43									
44 DIXONVILLE									
45 MANNVILLE	9	0.85	0.05	7		7	980	7	
46 TRIASSIC	8	0.90	0.05	7		7	1030	7	
47 LEDUC	4	0.85	0.05	3		3	1070	3	
48									
49 DONALDA									
50 VIKING	35	0.75	0.05	25		25	970	24	
51 MANNVILLE	11	0.85	0.05	9		9	980	9	
52									
53 DOWLING LAKE									
54 MANNVILLE	2	0.80	0.05	2	2	< 1	1030*	< 1	
55									
56 DRUMHELLER									
57 VIKING	3	0.85	0.05	2		2	1080	2	
58 MANNVILLE H	16	0.85	0.10	12	3	9	1080	10	2360
59 MANNVILLE (OTHER)	42	0.85	0.05	33	6	27	1080	29	
60 MANNVILLE F ASSOC	27	0.85	0.05	21	3	18	1080	19	37440
61									
62 MANN ASSOC (OTHER)	3	0.80	0.05	2		2	1080	2	
63 BANFF	3	0.80	0.10	2		2	1080	2	

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11 12 13 14 15 16 17 18 19 20

AVERAGE PAY THICKNESS FEET	POROSITY FRACTION	LIQUID SATURATION FRACTION	INITIAL PRESSURE PSIA	RESERVOIR TEMPERATURE °F	COMPRESS- IBILITY FACTOR FRACTION	RAW GAS SPECIFIC GRAVITY	AVERAGE WELL DEPTH FEET	DISCOVERY YEAR	DATE LAST REVIEWED, DISPOSITION AND REMARKS
13	0.27	0.50	1170	85	0.86	0.60	2830	1967	1968 TCPL 1968 TCPL
GIP BASED ON MATERIAL BALANCE							3500	1951	1968 TCPL 1964 TCPL
13	0.21	0.30	1470	110	0.82	0.67	4280	1958	1964 1968 1961
8	0.31	0.50	380	80	0.95	0.57	1200	1966	1967 1969 TCPL
10	0.35	0.50	380	80	0.95	0.57	1230	1966	1969 TCPL
7	0.28	0.45	430	80	0.95	0.56	1750	1966	1971
8	0.29	0.30	430	75	0.94	0.56	1830	1966	1970 1969 TCPL 1969
31	0.11	0.45	410	75	0.94	0.57	1660	1961	1969 TCPL
									1968 LOC U
									1969 1971 TCPL
9	0.12	0.30	2890	150	0.82	0.70	7330	1957	1971 WCOAST AND TCPL 1966 WCOAST AND TCPL
GIP BASED ON MATERIAL BALANCE							8410	1956	1969 A&S
72	0.08	0.15	3040	165	0.88	0.70	7430	1957	1971 WCOAST AND TCPL
44	0.08	0.20	3310	180	0.88	0.71	8200	1951	1964
GIP BASED ON MATERIAL BALANCE							8500	1954	1970 WCOAST AND TCPL
8	0.12	0.25	2890	140	0.81	0.70	7570	1964	1971 TCPL 1966
GIP BASED ON MATERIAL BALANCE							7490	1960	1968 TCPL
48	0.09	0.20	2780	170	0.82	0.74	7590	1967	1968 TCPL
GIP BASED ON MATERIAL BALANCE							8780	1960	1971 TCPL
									1962 BER 1962 BER 1962 BER
									1970 1969
									1970 LOC U
15	0.16	0.45	1450	115	0.82	0.66	4380	1961	1967 1968 TCPL 1966 TCPL
9	0.20	0.25	1430	120	0.82	0.68	4220	1950	1968 TCPL 1966 1963 TCPL

TABLE A-1 (CONTINUED) - ESTABLISHED RESERVES OF GAS IN THE PROVINCE

1	2	3	4	5	6	7	8	9	10
POOL OR ZONE	INITIAL GAS IN PLACE BCF	POOL RECOVERY FRACTION	SURFACE LOSS FRACTION	INITIAL MARKETABLE GAS BCF	MARKETABLE GAS PRODUCED JUNE 30/71 BCF	REMAINING MARKETABLE GAS JUNE 30/71 BCF	GROSS HEATING VALUE BTU/CU. FT.	REMAINING MARKETABLE GAS AT 1000 BTU BCF	AREA ACRES
1 DUHAMEL									
2 VIKING	1	0.90	0.05	1		1	1000	1	
3 MANNVILLE	5	0.85	0.05	4	1	3	1030	3	
4 D-2 ASSOC	2	0.90	0.10	2		2	1100	2	
5 D-2 SOLN	5	0.45	0.40	1	1	< 1	1100	< 1	
6									
7 D-3 ASSOC		0.90	0.05		-2	2	1100	2	
8 D-3 SOLN	6	0.50	0.55	1	1	< 1	1100	< 1	
9									
10 DUNVEGAN									
11 PEACE RIVER A	20	0.70	0.05	13		13	1000	13	6340
12 GETHING	6	0.85	0.10	5		5	1010	5	
13 DEBOLT A	220	0.75	0.05	155		155	1070	166	34070
14 DEBOLT B	470	0.75	0.05	335		335	1070	358	31500
15									
16 DEBOLT C	390	0.75	0.05	210		210	1070	225	18090
17									
18 DUVENAY									
19 VIKING	4	0.80	0.05	3	2	1	1000*	1	
20									
21 FAGLESHAM									
22 BLUESKY	5	0.85	0.05	4		4	990	4	
23 CADOMIN	7	0.85	0.05	5		5	970	5	
24 DEBOLT A	17	0.85	0.05	14		14	1070	15	2040
25 DEBOLT B	19	0.85	0.05	15		15	1070	16	1100
26									
27 DEBOLT C	26	0.85	0.05	21		21	1070	22	1100
28									
29 EDSON									
30 GETHING A	210	0.85	0.10	160	19	141	1050	148	11170
31 ELK A, SHUN A, & SHUN B	2350	0.90	0.10	1910	371	1539	1050*	1616	121800
32 ELKTON 26-51-19	22	0.85	0.10	17		17	1050*	18	1100
33 ELKTON 33-51-19	23	0.85	0.10	18		18	1050*	19	1100
34									
35 RUNDLE (OTHER)	5	0.85	0.10	4		4	1050*	4	
36									
37 EDWARD									
38 MANNVILLE	6	0.85	0.05	5		5	1000	5	
39 NISKU	2	0.85	0.05	1		1	1000	1	
40									
41 FLK POINT									
42 MANNVILLE	3	0.80	0.05	2	1	1	990*	1	
43									
44 ELNORA									
45 UPPER MANNVILLE A	15	0.75	0.05	11		11	1100	12	7370
46 LOWER MANNVILLE A	25	0.75	0.05	18		18	1100	20	6870
47 MANNVILLE (OTHER)	3	0.80	0.05	2		2	1100	2	
48									
49 ENCHANT									
50 MILK RIVER	5	0.75	0.05	3		3	1000*	3	
51 BOW ISLAND A	15	0.75	0.05	11	1	10	1000*	10	33360
52 BOW ISLAND (OTHER)	15	0.85	0.05	12	6	6	1000*	6	
53 BASAL COLORADO	1	0.75	0.05	1		1	1000*	1	
54									
55 UPPER MANNVILLE A	13	0.85	0.05	11	4	7	1000*	7	4010
56 MANNVILLE (OTHER)	11	0.85	0.10	8	1	7	1000*	7	
57 JURASSIC	2	0.75	0.10	2		2	1000*	2	
58 RUNDLE	5	0.85	0.10	4	3	1	1000*	1	
59									
60 EQUITY									
61 VIKING	2	0.80	0.10	1		1	1020	1	
62 MANNVILLE	4	0.80	0.05	3		3	1130*	3	
63 LOWER MANN A & PEK A	53	0.75	0.10	37	5	32	1130*	36	8720

OF ALBERTA, JUNE 30, 1971 (14.65 PSIA AND 60°F.)

11 12 13 14 15 16 17 18 19 20

AVERAGE PAY THICKNESS FEET	POROSITY FRACTION	LIQUID SATURATION FRACTION	INITIAL PRESSURE PSIA	RESERVOIR TEMPERATURE °F	COMPRESS- IBILITY FACTOR FRACTION	RAW GAS SPECIFIC GRAVITY	AVERAGE WELL DEPTH FEET	DISCOVERY YEAR	DATE LAST REVIEWED, DISPOSITION AND REMARKS
									1970 INJECTED INTO D-3
									1965 INJECTED INTO D-3
									1957 INJECTED INTO D-3
									1971 INJECTED INTO D-3
									1970
									1966 INJECTED INTO D-3
14	0.32	0.25	310	75	0.96	0.56	1470	1951	1971
11	0.14	0.40	2050	120	0.81	0.64	4700	1952	1971
25	0.14	0.40	2090	120	0.81	0.64	4780	1952	1971
25	0.15	0.40	2240	160	0.81	0.64	4900	1952	1971
									1970 WML AND LOC U
									1965
									1965
11	0.18	0.25	1870	135	0.85	0.64	4480	1959	1966
17	0.20	0.20	1980	125	0.83	0.64	4710	1952	1965
23	0.20	0.20	2000	125	0.81	0.65	4700	1959	1965
28	0.10	0.25	3360	180	0.88	0.68	8420	1963	1971 TCPL
22	0.10	0.10	3880	225	0.94	0.63	9380	1962	1969 TCPL
31	0.08	0.10	3990	210	0.94	0.63	10120	1964	1966
24	0.10	0.10	3880	240	0.94	0.64	10300	1953	1970
									1966
									1971 LOC U
									1969
									1964 LOC U
4	0.19	0.30	1190	115	0.87	0.62	5010	1969	1969
8	0.18	0.35	1290	120	0.85	0.62	5070	1969	1969
									1953
2	0.15	0.30	950	80	0.89	0.59	2470	1959	1964
									1967 TCPL
									1967 TCPL
									1962 TCPL
5	0.20	0.35	1580	90	0.81	0.66	3300	1953	1968 TCPL
									1961 TCPL
									1961
									1966 TCPL
									1970
									1968 TCPL
22	0.08	0.35	1620	125	0.83	0.67	5370	1962	1970 TCPL

TABLE A-1 (CONTINUED) - ESTABLISHED RESERVES OF GAS IN THE PROVINCE

1	2	3	4	5	6	7	8	9	10
POOL OR ZONE	INITIAL GAS IN PLACE BCF	POOL RECOVERY FRACTION	SURFACE LOSS FRACTION	INITIAL MARKETABLE GAS BCF	MARKETABLE GAS PRODUCED JUNE 30/71 BCF	REMAINING MARKETABLE GAS JUNE 30/71 BCF	GROSS HEATING VALUE BTU/CU FT.	REMAINING MARKETABLE GAS AT 1000 BTU BCF	AREA ACRES
1 ERSKINE									
2 VIKING	4	0.80	0.05	3		3	1040	3	
3 BLAIRMORE	27	0.80	0.10	20	5	15	1090	16	
4 D-2 SOLN	1	0.65	0.35	1		1	1100	1	
5 D-3	1	0.85	0.20	1		1	1070	1	
6									
7 D-3 ASSOC	34	0.90	0.20	25**					2760
8 D-3 SOLN	19	0.50	0.75	2**	4**	23	1110	26	
9									
10 ESTHER									
11 BELLY RIVER A	21	0.75	0.05	15		15	990	15	31050
12 MANNVILLE	1	0.85	0.05	1		1	1010	1	
13 BANFF A	25	0.85	0.05	20	7	13	1000	13	
14 BANFF (OTHER)	3	0.85	0.05	2		2	1000	2	
15									
16 FTHEL LAKE									
17 MANNVILLE	3	0.80	0.05	2	1	1	1000	1	
18									
19 ETZIKOM									
20 BOW ISLAND A	68	0.75	0.05	48	37	11	930	10	
21 MANNVILLE	2	0.75	0.05	1		1	1010	1	
22									
23 EXCELSIOR									
24 VIKING	8	0.80	0.05	7	3	4	1000	4	
25 MANNVILLE	1	0.80	0.10	1		1	970	1	
26 MANNVILLE A ASSOC	38	0.90	0.05	33		33	970	32	3270
27									
28 FAIRYDELL-BON ACCORD									
29 VIKING A	120	0.80	0.05	88	50	38	1020*	39	
30 VIKING (OTHER)	8	0.80	0.05	6	2	4	1050*	4	
31 MANNVILLE	14	0.80	0.05	11	3	8	990	8	
32 BASAL MANN C ASSOC	17	0.80	0.10	12	1	11	990	11	1430
33									
34 MANN ASSOC (OTHER)	1	0.80	0.05	1		1	990	1	
35									
36 FENN-BIG VALLEY									
37 VIKING	19	0.80	0.90	2	1	1	1000*	1	
38 D-2 A SOLN	150	0.65	0.85	15	9	6	1110*	7	
39 D-3 SOLN	9	0.60	0.85	1	1	< 1	1110*	< 1	
40									
41 FERRIER									
42 BELLY RIVER SOLN	4	0.60	0.40	2		2	960	2	
43 CARDIUM 34-40-9	20	0.80	0.10	15		15	1080*	16	1100
44 CARDIUM (OTHER)	8	0.80	0.10	6		6	1080*	6	
45 CARDIUM D ASSOC	120	0.85	0.10	95**					8860
46									
47 CARDIUM D SOLN	120	0.45	0.20	42**	12**	125	1080*	135	
48 CARDIUM E ASSOC	410	0.85	0.10	310**					12940
49 CARDIUM E SOLN	190	0.23	0.20	35**	33**	312	1080*	337	
50 CARDIUM SOLN (OTHER)	6	0.65	0.25	3	1	2	1080*	2	
51 VIKING	4	0.85	0.15	3		3	1130	3	
52									
53 VIKING A SOLN	31	0.65	0.25	15	5	10	1150*	12	
54 RUNDLE	2	0.80	0.10	2		2	1100	2	
55 BANFF	8	0.85	0.10	6		6	1100	7	
56									
57 FERRYBANK									
58 BELLY RIVER	2	0.80	0.05	1		1	1070*	1	
59 VIKING	4	0.75	0.05	3		3	1050	3	
60 MANNVILLE	5	0.80	0.05	4		4	1020	4	
61 MANNVILLE ASSOC	4	0.85	0.10	3		3	1020	3	
62									
63 BANFF	6	0.85	0.10	4		4	1080*	4	

[illegible]

TABLE A-1 (CONTINUED) - ESTABLISHED RESERVES OF GAS IN THE PROVINCE

1	2	3	4	5	6	7	8	9	10
POOL OR ZONE	INITIAL GAS IN PLACE BCF	POOL RECOVERY FRACTION	SURFACE LOSS FRACTION	INITIAL MARKETABLE GAS BCF	MARKETABLE GAS PRODUCED JUNE 30/71 BCF	REMAINING MARKETABLE GAS JUNE 30/71 BCF	GROSS HEATING VALUE BTU/CUB FT.	REMAINING MARKETABLE GAS AT 1000 BTU BCF	AREA ACRES
FIGURE LAKE									
VIKING	4	0.75	0.05	3		3	960	3	
MANNVILLE	13	0.80	0.05	10	1	9	1000	9	
D-2 B	13	0.85	0.05	11	2	9	1000	9	7650
D-2 (OTHER)	12	0.85	0.05	9	1	8	1000	8	
FIRE									
SLAVE POINT	1	0.90	0.15	1		1	1100	1	
SULPHUR POINT	10	0.90	0.15	8		8	1100*	9	
SULPHUR POINT ASSCC	3	0.85	0.15	2		2	1100*	2	
KEG RIVER SOLN	2	0.75	0.15	1		1	1200*	1	
FLAT									
MANNVILLE A	15	0.80	0.05	11	1	10	1020	10	11130
MANNVILLE (OTHER)	32	0.80	0.05	24		24	1020	24	
WABAMUN A	130	0.80	0.05	100	11	89	990*	88	21790
FOREMOST									
BCW ISLAND	31	0.85	0.05	27	10	17	960*	16	10400
FORESTBURG									
MANNVILLE	2	0.80	0.05	2		2	1000	2	
FCRT KENT									
MANNVILLE	5	0.75	0.05	4	2	2	980	2	
FOX CREEK									
VIKING A	97	0.75	0.05	69	10	59	1110	65	21790
SPIRIT RIVER	9	0.80	0.05	7		7	1180	8	
CADOMIN	42	0.85	0.05	34	2	32	1100	35	
TRIASSIC	3	0.90	0.10	2		2	1160	2	
FOX CREEK WEST									
CADOMIN	15	0.85	0.05	12		12	1160	14	
GARRINGTON									
MANNVILLE	12	0.85	0.10	9		9	1010	9	
MANNVILLE ASSOC	3	0.90	0.15	2		2	1010	2	
LEDUC 23-35-4	23	0.85	0.20	15		15	1140*	17	500
LEDUC (OTHER)	7	0.85	0.20	5	1	4	1140*	5	
LEDUC ASSOC 36-35-4	15	0.85	0.20	10		10	1140*	11	500
GHOST PINE									
VIKING	8	0.80	0.05	6		6	1020	6	
U MANN C,G,H,P,U,AA	210	0.85	0.05	170	51	119	1130	134	48050
UPPER MANNVILLE Y	16	0.85	0.05	13	5	8	1130	9	3570
UPPER MANNVILLE FF	56	0.85	0.05	45	7	38	1130	43	17070
LOWER MANNVILLE F	13	0.85	0.10	10	4	6	1130	7	
MANNVILLE (OTHER)	46	0.85	0.05	36	5	31	1130	35	
UPPER MANN Q ASSCC	120	0.85	0.05	95		95	1130	107	9000
MANN ASSOC (OTHER)	13	0.80	0.05	9	2	7	1130	8	
PEKISKO B	17	0.80	0.10	12		12	1070	13	6520
PEKISKO G	16	0.85	0.10	12	7	5	1070	5	
RUNDLE (OTHER)	9	0.80	0.10	7	1	6	1070	6	
GILBY									
CARDIUM	2	0.85	0.10	2		2	1000	2	
VIKING ASSOC	1	0.75	0.05	1		1	1080*	1	
BASAL MANNVILLE D	52	0.80	0.15	35	9	26	1080*	28	
MANNVILLE (OTHER)	42	0.85	0.15	31	1	30	1080*	32	

OF ALBERTA, JUNE 30, 1971 (14 65 PSIA AND 60°F.)

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AVERAGE PAY THICKNESS FEET	POROSITY FRACTION	LIQUID SATURATION FRACTION	INITIAL PRESSURE PSIA	RESERVOIR TEMPERATURE °F	COMPRESS- IBILITY FACTOR FRACTION	RAW GAS SPECIFIC GRAVITY	AVERAGE WELL DEPTH FEET	DISCOVERY YEAR	DATE LAST REVIEWED, DISPOSITION AND REMARKS
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11	0.15	0.45	630	80	0.92	0.57	2250	1957	1966 1966 TCPL 1966 TCPL 1966 TCPL 1971 1968 1969 1971
10	0.20	0.50	490	80	0.94	0.57	1870	1949	1971 LOC U
42	0.23	0.45	490	70	0.93	0.58	1860	1956	1971 LOC U 1971 TCPL
7	0.24	0.20	690	70	0.92	0.58	2080	1916	1953 CWNG 1968 LOC U 1966 LOC U
11	0.15	0.40	1480	140	0.85	0.67	5620	1957	1967 A&S 1967 1967 A&S 1967 1968 1964 1967 1964 1964 TCPL
125	0.05	0.20	3760	220	0.94	0.75	10010	1954	1964
85	0.05	0.20	3700	220	0.95	0.77	9880	1956	1964 1967 TCPL 1971 TCPL 1971 TCPL 1971 TCPL
7	0.20	0.35	1540	125	0.82	0.67	4580	1963	1971 TCPL
7	0.20	0.35	1510	135	0.83	0.69	4880	1966	1971 TCPL
8	0.16	0.50	1520	130	0.83	0.69	4830	1961	1971 TCPL
							4830	1955	1971 TCPL 1971 TCPL
20	0.20	0.35	1560	130	0.83	0.67	4770	1954	1971 TCPL 1971 TCPL
15	0.05	0.30	1620	125	0.82	0.69	5060	1962	1967 GIP BASED ON MATERIAL BALANCE 4540 1962 1971 TCPL 1967 TCPL
							6830	1962	1965 1965 1971 TCPL 1966 TCPL

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TABLE A-1 (CONTINUED) - ESTABLISHED RESERVES OF GAS IN THE PROVINCE

1	2	3	4	5	6	7	8	9	10
POOL OR ZONE	INITIAL GAS IN PLACE BCF	POOL RECOVERY FRACTION	SURFACE LOSS FRACTION	INITIAL MARKETABLE GAS BCF	MARKETABLE GAS PRODUCED JUNE 30/71 BCF	REMAINING MARKETABLE GAS JUNE 30/71 BCF	GROSS HEATING VALUE BTU/CU FT	REMAINING MARKETABLE GAS AT 1000 BTU BCF	AREA ACRES
1 GILRY (CONTINUED)									
2 MANNVILLE ASSOC	4	0.80	0.15	3		3	1080*	3	
3 BASAL MANN A & JUR D	270	0.80	0.08	200	42	158	1080*	171	
4 BASAL MANN H & JUR E	150	0.80	0.10	110	14	96	1080*	104	7840
5 JURASSIC A	75	0.80	0.04	58	7	51	1080*	55	6050
6 JURASSIC C	48	0.80	0.04	37	18	19	1080*	21	
7									
8 JURASSIC (OTHER)	8	0.80	0.04	6		6	1080*	6	
9 JURASSIC B ASSOC	18	0.75	0.04	13		13	1080*	14	1220
0 RUNDLE C	270	0.85	0.05	220	99	121	1080*	131	
1 RUNDLE D	190	0.85	0.05	150	54	96	1080*	104	
2 RUNDLE H	16	0.85	0.05	13		13	1080*	14	2420
3									
4 RUNDLE (OTHER)	17	0.85	0.05	13		13	1080*	14	
5 WABAMUN	7	0.90	0.20	5		5	1170	6	
6									
7 GLENEVIS									
8 MANNVILLE	16	0.80	0.10	12		12	1040	12	
9									
0 GLEN PARK									
1 MANNVILLE	6	0.80	0.05	4		4	1140	5	
2 D-3 SOLN	16	0.65	0.15	9	2	7	1250	9	
3									
4 GOLD CREEK									
5 SPIRIT RIVER	7	0.75	0.05	5	1	4	1050	4	
6 BLUESKY-GETHING A	46	0.80	0.05	35	3	32	1130	36	9330
7 GETHING (OTHER)	4	0.85	0.10	3		3	1050	3	
8 CADOMIN B	25	0.85	0.05	20	2	18	1110*	20	2030
9									
0 WABAMUN A	250	0.75	0.30	130	6	124	1040*	129	6430
1 WABAMUN B	92	0.80	0.30	51		51	1040*	53	1100
2 WABAMUN (OTHER)	1	0.80	0.30	1		1	1040*	1	
3									
4 GOLDEN SPIKE									
5 VIKING	8	0.80	0.05	6	1	5	1050	5	
6 BLAIRMORE	17	0.80	0.05	13	3	10	1050	11	
7 D-1 A	33	0.85	0.10	25	14	11	1060	12	
8 D-2 ASSOC	3	0.85	0.15	2		2	1120	2	
9									
0 D-2 SOLN	8	0.65	0.20	4	1	3	1120*	3	
1 D-3 A ASSOC		0.90	0.10		-71	71	1100*	78	
2 D-3 A SOLN	130	0.90	0.40	69	36	33	1130*	37	
3									
4 GOODWIN									
5 JURASSIC A	13	0.85	0.10	10		10	1070	11	3730
6									
7 GORDONDALE									
8 PEACE RIVER	34	0.85	0.05	27	26	1	1000	1	9190
9 PEACE RIVER (OTHER)	1	0.85	0.05	1		1	1000	1	
0 SPIRIT RIVER	6	0.85	0.05	5		5	1000	5	
1 GETHING A	29	0.75	0.03	21	18	3	1020	3	
2									
3 GETHING B	12	0.90	0.05	10	9	1	1020	1	
4 CADOMIN	8	0.85	0.05	6	5	1	1020	1	
5									
6 GREENCOURT									
7 JURASSIC A	41	0.80	0.10	31	3	28	1070	30	8500
8 JURASSIC B	14	0.80	0.05	10		10	1070	11	3770
9 RUNDLE	3	0.80	0.05	2		2	1130	2	
0 PFKISKO A ASSOC	130	0.85	0.10	98	5	93	1130	105	7830
1									
2 HACKETT									
3 MANNVILLE A	25	0.80	0.09	18	11	7	1100	8	
4 MANNVILLE (OTHER)	2	0.85	0.10	1		1	1100	1	

OF ALBERTA, JUNE 30, 1971 (14.65 PSIA AND 60°F.)

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AVERAGE PAY THICKNESS FEET	POROSITY FRACTION	LIQUID SATURATION FRACTION	INITIAL PRESSURE PSIA	RESERVOIR TEMPERATURE °F	COMPRESS- IBILITY FACTOR FRACTION	RAW GAS SPECIFIC GRAVITY	AVERAGE WELL DEPTH FEET	DISCOVERY YEAR	DATE LAST REVIEWED, DISPOSITION AND REMARKS
									1967
32	0.13	0.35	2310	155	0.81	0.72	7080	1956	1971 TCPL
17	0.14	0.30	2300	150	0.81	0.73	6980	1956	1971 TCPL
							6840	1953	1968 TCPL
							6920	1955	1970 TCPL
									1968
16	0.16	0.20	2310	160	0.82	0.73	7000	1958	1968
							6970	1955	1971 TCPL
							6770	1955	1971 TCPL
29	0.04	0.20	2320	170	0.83	0.72	7250	1961	1968
									1968
									1961
									1966
									1965 NUL
									1966 NUL
									1970 A&S
7	0.12	0.40	3210	160	0.82	0.73	7040	1967	1971 A&S
									1968
22	0.09	0.30	2870	145	0.82	0.69	6910	1966	1970
53	0.07	0.15	5150	215	0.95	1.22	10900	1964	1971 A&S
122	0.07	0.15	5150	215	1.00	0.99	11460	1964	1968
									1971 A&S
									1965 INJECTED INTO D-3
									1968 INJECTED INTO D-3
							4540	1949	1970 INJECTED INTO D-3
									1966
									1965 INJECTED INTO D-3
							5670	1949	1968
									1966 INJECTED INTO D-3
15	0.20	0.70	2010	155	0.86	0.66	5790	1956	1971
15	0.19	0.30	620	90	0.93	0.57	2740	1952	1962 WCOAST
									1962
									1969
							4240	1953	1971 WCOAST
							4350	1957	1970 WCOAST
									1969 WCOAST
19	0.13	0.60	1620	140	0.83	0.69	4710	1961	1971 TCPL
11	0.15	0.45	1600	140	0.83	0.69	4800	1967	1969
									1968
39	0.12	0.25	1620	145	0.85	0.64	4740	1961	1969 TCPL
									1963
							3840	1952	1970 TCPL

TABLE A-1 (CONTINUED) - ESTABLISHED RESERVES OF GAS IN THE PROVINCE

1	2	3	4	5	6	7	8	9	10
POOL OR ZONE	INITIAL GAS IN PLACE BCF	POOL RECOVERY FRACTION	SURFACE LOSS FRACTION	INITIAL MARKETABLE GAS BCF	MARKETABLE GAS PRODUCED JUNE 30/71 BCF	REMAINING MARKETABLE GAS JUNE 30/71 BCF	GROSS HEATING VALUE BTU/CU FT	REMAINING MARKETABLE GAS AT 1000 BTU BCF	AREA ACRES
1 HAIRY HILL									
2 VIKING	2	0.75	0.05	1		1	980	1	
3 CCLONY A	31	0.90	0.05	27	15	12	1000*	12	
4 MANNVILLE (OTHER)	1	0.85	0.05	1		1	1000*	1	
5 NISKU	3	0.80	0.05	2		2	1000	2	
6									
7 HALLIDAY									
8 VIKING	5	0.80	0.05	4	1	3	1040	3	
9									
10 HAMELIN CREEK									
11 PEACE RIVER	3	0.80	0.05	2		2	1000	2	
12 GETHING	3	0.85	0.05	3		3	1010	3	
13 CADOMIN	14	0.40	0.05	5	5		1060		
14 TRIASSIC	2	0.75	0.05	1		1	1160	1	
15									
16 HANNA									
17 VIKING	10	0.85	0.05	8		8	1040	8	
18 MANNVILLE	3	0.85	0.05	2		2	1050	2	
19 BANFF	1	0.80	0.05	1		1	1080	1	
20									
21 HARMATTAN EAST									
22 RUNDLE ASSOC	1110	0.85	0.15	800**					49090
23 RUNDLE SOLN	200	0.65	0.30	90**	26**	864	1080*	933	
24									
25									
26 HARMATTAN-ELKTON									
27 BLAIRMORE	3	0.90	0.05	2		2	1020	2	
28 RUNDLE A	47	0.25	0.14	10	7	3	1110*	3	2300
29 RUNDLE B ASSOC	28	0.85	0.15	21	12	9	1080*	10	7140
30 RUNDLE C ASSOC	1150	0.87	0.20	800**					17940
31									
32 RUNDLE C SOLN	180	0.65	0.30	83**	-17**	900	1080*	972	
33 C-2 A	430	0.80	0.68	110	17	93	950*	88	10120
34									
35 HEART RIVER									
36 PEACE RIVER	2	0.80	0.05	1	1	< 1	1000	< 1	
37 SPIRIT RIVER	2	0.80	0.05	2	1	1	1000	1	
38									
39 HERCULES									
40 VIKING	18	0.90	0.05	15		15	1050	16	
41 MANNVILLE	7	0.80	0.05	6	1	5	960	5	
42									
43 HIGHLAND									
44 VIKING	1	0.75	0.05	1		1	1000	1	
45 MANNVILLE	11	0.85	0.05	9		9	1010	9	
46									
47 HIGH PRAIRIE									
48 PEACE RIVER	3	0.85	0.05	3		3	1000	3	
49 SPIRIT RIVER	8	0.85	0.05	6		6	1100	7	
50 GETHING	2	0.85	0.05	1		1	1000	1	
51									
52 HCLBURN									
53 CARDIUM	8	0.80	0.05	6	4	2	980	2	
54 MANNVILLE	16	0.85	0.10	12	1	11	1120	12	
55									
56 HCLMBERG									
57 MANNVILLE	16	0.75	0.05	12		12	1050	13	
58									
59 HCMEGLEN-RIMBEY									
60 D-3 ASSOC	1090	0.85	0.18	760**					11550
61 D-3 SOLN	86	0.50	0.15	37**	364**	433	1040*	450	
62									
63 HUDSON									
64 MANNVILLE	1	0.85	0.05	1		1	1010	1	

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AVERAGE PAY THICKNESS FEET	POROSITY FRACTION	LIQUID SATURATION FRACTION	INITIAL PRESSURE PSIA	RESERVOIR TEMPERATURE °F	COMPRESS- IBILITY FACTOR FRACTION	RAW GAS SPECIFIC GRAVITY	AVERAGE WELL DEPTH FEET	DISCOVERY YEAR	DATE LAST REVIEWED, DISPOSITION AND REMARKS
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GIP BASED ON MATERIAL BALANCE

1790 1954

1961 WML
1970 WML
1966
1966

1961 TCPL

1962
1961
1970 POOL ABANDONED
1961

1966
1957
1957 LOC U

31 0.10 0.20 3420 185 0.86 0.84 8370 1954 1971
8620 1954 1969 TCPL AND CYCLING
SCHEME

33 0.08 0.20 3630 205 0.89 0.71 9150 1957 1966
6 0.09 0.20 3430 195 0.85 0.82 8960 1955 1969 TCPL
70 0.11 0.10 3630 200 0.87 0.84 8950 1954 1964 TCPL
1970

70 0.05 0.10 4680 230 0.77 0.93 9130 1954 1966 TCPL
11000 1961 1969 A&S

1964 LOC U
1964 LOC U

1955
1966 NUL

1970 BER
1970 BER

1961 BER
1961 BER
1961 BER

1966 GOLDEN SPIKE INJ
1968 GOLDEN SPIKE INJ

1970 BAROID

172 0.08 0.10 2830 180 0.85 0.72 7830 1953 1970
7930 1953 1964 TCPL AND A&S

1969

TABLE A-1 (CONTINUED) - ESTABLISHED RESERVES OF GAS IN THE PROVINCE

1	2	3	4	5	6	7	8	9	10
POOL OR ZONE	INITIAL GAS IN PLACE BCF	POOL RECOVERY FRACTION	SURFACE LOSS FRACTION	INITIAL MARKETABLE GAS BCF	MARKETABLE GAS PRODUCED JUNE 30/71 BCF	REMAINING MARKETABLE GAS JUNE 30/71 BCF	GROSS HEATING VALUE BTU/CU FT.	REMAINING MARKETABLE GAS AT 1000 BTU BCF	AREA ACRES
1 HUDSON (CONTINUED)									
2 BANFF	6	0.80	0.05	4		4	1020	4	
3									
4 HUNTER VALLEY									
5 RUNDLE A	73	0.85	0.25	47	2	45	1000	45	1570
6 RUNDLE (OTHER)	5	0.85	0.25	3		3	1000	3	
7									
8 HUSSAR									
9 BELLY RIVER	10	0.75	0.05	7	4	3	1000	3	
10 VIKING B	32	0.75	0.05	22	5	17	1020*	17	13000
11 VIKING E	24	0.80	0.05	18	5	13	1020*	13	13590
12 VIKING (OTHER)	23	0.80	0.05	17	5	12	1020*	12	
13									
14 BASAL CCLORADO A	26	0.75	0.05	19	9	10	1020*	10	16390
15 BASAL CCLORADO C	18	0.80	0.05	13	11	2	1030*	2	
16 ESL COLORADO (OTHER)	5	0.80	0.05	4	1	3	1030*	3	
17 GLAUCONITIC N	110	0.85	0.05	87	71	16	1030*	16	
18 GLAUCONITIC P	17	0.85	0.05	14	13	1	1030*	1	500
19									
20 GLAUCONITIC Q	20	0.85	0.05	16	10	6	1030*	6	
21 GLAUCONITIC R	17	0.85	0.05	13	11	2	1030*	2	
22 CSTRACOD F	27	0.80	0.05	20		20	1030*	21	8300
23 CSTRACOD R	26	0.85	0.05	21	2	19	1030*	20	7480
24 BASAL MANNVILLE B	30	0.85	0.05	25		25	1030*	26	1330
25									
26 BASAL MANNVILLE D	11	0.90	0.05	10	1	9	1030*	9	530
27 MANNVILLE (OTHER)	100	0.85	0.05	80	14	66	1030*	68	
28 GLAUCONITIC A ASSCC	75	0.85	0.05	61	25	36	1030*	37	4770
29 GLAUCONITIC B ASSCC	19	0.85	0.05	15	13	2	1030*	2	3900
30 MANN ASSOC (OTHER)	29	0.80	0.05	22	5	17	1030*	18	
31									
32 GLAUCONITIC A SOLN	20	0.65	0.25	10	2	8	1030*	8	
33 MANN SOLN (OTHER)	1	0.65	0.15	1		1	1030*	1	
34									
35 HUXLEY									
36 VIKING A	55	0.80	0.05	42		42	1100	46	11610
37 MANNVILLE	6	0.80	0.05	5		5	1100	6	
38									
39 INLAND									
40 VIKING A	17	0.80	0.05	13		13	980	13	15300
41 MANNVILLE	2	0.80	0.10	1		1	1000	1	
42									
43 INNISFAIL									
44 RUNDLE	22	0.90	0.10	18		18	1080	19	
45 WABAMUN	3	0.85	0.15	2		2	1080	2	
46 D-3 B	19	0.85	0.20	13		13	1020	13	500
47 D-3 (OTHER)	12	0.85	0.20	8		8	1020	8	
48									
49 D-3 ASSOC	17	0.90	0.35	10		10	1020	10	1220
50 D-3 SOLN	210	0.60	0.45	69	22	47	1140	54	
51									
52 IRRICANA									
53 BELLY RIVER	1	0.75	0.05	1		1	1000*	1	
54 WABAMUN A	27	0.85	0.50	11	3	8	980	8	3300
55									
56 JARVIE									
57 VIKING	10	0.80	0.05	7		7	1040	7	
58 MANNVILLE	9	0.85	0.05	8		8	1100	9	
59									
60 JENNER									
61 2WS	4	0.80	0.05	3		3	970	3	
62 VIKING	11	0.80	0.05	7		7	990	7	
63 BASAL COLORADO	8	0.80	0.05	6		6	1040	6	
64 BASAL CCLORADO ASSCC	1	0.85	0.05	1		1	1040	1	

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AVERAGE PAY THICKNESS FEET	POROSITY FRACTION	LIQUID SATURATION FRACTION	INITIAL PRESSURE PSIA	RESERVOIR TEMPERATURE °F	COMPRESS- IBILITY FACTOR FRACTION	RAW GAS SPECIFIC GRAVITY	AVERAGE WELL DEPTH FEET	DISCOVERY YEAR	DATE LAST REVIEWED, DISPOSITION AND REMARKS
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									1970 MOBIL
83	0.07	0.20	3580	145	0.84	0.68	8690	1962	1964 A&S AND TCPL 1964
5	0.20	0.30	1120	105	0.88	0.63	4030	1955	1970 TCPL
4	0.20	0.30	1150	100	0.89	0.63	3700	1961	1961 TCPL 1966 TCPL 1961 TCPL
3	0.17	0.30	1240	110	0.88	0.61	4330	1952	1961 TCPL
		GIP BASED ON MATERIAL BALANCE					4120	1955	1970 TCPL 1965 TCPL
		GIP BASED ON MATERIAL BALANCE					4480	1955	1969 TCPL
48	0.21	0.30	1490	110	0.82	0.65	4500	1957	1968 TCPL
		GIP BASED ON MATERIAL BALANCE					4600	1960	1971 TCPL
		GIP BASED ON MATERIAL BALANCE					4650	1960	1971 TCPL
5	0.21	0.25	1370	110	0.84	0.65	4570	1956	1964 TCPL
5	0.20	0.35	1510	115	0.82	0.65	4660	1956	1965 TCPL
45	0.15	0.30	1470	105	0.82	0.67	4330	1960	1963
38	0.16	0.30	1510	115	0.83	0.66	4820	1955	1961 TCPL 1968 TCPL
19	0.22	0.25	1480	110	0.83	0.64	4690	1952	1967 TCPL
7	0.20	0.30	1470	110	0.83	0.67	4600	1956	1967 TCPL 1968 TCPL
							4650	1952	1967 TCPL 1971
12	0.15	0.35	1250	115	0.86	0.64	4850	1963	1971 1964
3	0.22	0.40	800	80	0.90	0.60	2190	1959	1963 1963
									1961 1961
39	0.12	0.15	3410	185	0.85	0.79	8730	1969	1969 TCPL 1970
28	0.06	0.15	3550	195	0.84	0.81	8440 8580	1957 1957	1961 1971 TCPL
14	0.06	0.15	3530	165	0.71	0.90	7600	1958	1971 1968 WCOAST
									1960 BER 1956 BER
									1969 1961 1961 TCPL 1969

TABLE A-1 (CONTINUED) - ESTABLISHED RESERVES OF GAS IN THE PROVINCE

1	2	3	4	5	6	7	8	9	10
POOL OR ZONE	INITIAL GAS IN PLACE BCF	POOL RECOVERY FRACTION	SURFACE LOSS FRACTION	INITIAL MARKETABLE GAS BCF	MARKETABLE GAS PRODUCED JUNE 30/71 BCF	REMAINING MARKETABLE GAS JUNE 30/71 BCF	GROSS HEATING VALUE BTU/CU. FT.	REMAINING MARKETABLE GAS AT 1000 BTU BCF	AREA ACRES
JENNER (CONTINUED)									
MANNVILLE	25	0.85	0.05	19		19	1050	20	
MANNVILLE ASSOC	8	0.85	0.05	7		7	1050	7	
RUNDLE	1	0.85	0.05	1		1	1000	1	
RUNDLE ASSOC	3	0.85	0.05	2		2	1000	2	
JCARCAM									
VIKING	1	0.75	0.05	1		1	1040	1	
VIKING ASSOC	70	0.75	0.35	35	-2	37	1040	38	13520
VIKING SOLN	42	0.41	0.65	5	2	3	1050	3	
RSL CTZ 30-50-22	15	0.90	0.05	13		13	960	12	500
MANNVILLE (OTHER)	3	0.90	0.05	3		3	960	3	
JOFFRE									
BLAIRMORE	41	0.85	0.10	32	1	31	1020	32	
LEDUC ASSOC	2	0.85	0.15	2		2	1050	2	
JUDY CREEK									
VIKING	6	0.80	0.05	5		5	1010	5	
VIKING A ASSOC	85	0.80	0.05	65	20	45	1010	45	
BH LK A SOLN	560	0.45	0.30	170	33	137	1090*	149	
BH LK B SOLN	270	0.48	0.30	89	16	73	1090*	80	
JUDY CREEK SOUTH									
RUNDLE A	13	0.90	0.10	10		10	1050*	11	500
JUMPING PCUND									
MISSISSIPPIAN	840	0.88	0.16	620	309	311	1050*	327	
JUMPING POUND WEST									
RUNDLE A	1160	0.80	0.20	740	53	687	1040*	714	11430
RUNDLE B	200	0.80	0.20	130	5	125	1040*	130	1920
RUNDLE C	470	0.80	0.20	300	7	293	1040*	305	6810
RUNDLE D	31	0.80	0.20	20		20	1040*	21	490
KAYBOB									
NOTIKEWIN A	200	0.85	0.05	160	57	103	1100*	113	25650
NOTIKEWIN B	170	0.85	0.05	140	74	66	1100*	73	
NOTIKEWIN D	17	0.85	0.05	14		14	1100*	15	5660
SPIRIT RIVER (OTHER)	10	0.85	0.05	8		8	1000	8	
GETHING	16	0.85	0.05	13		13	1050	14	
CADOMIN	48	0.85	0.05	38		38	1040	40	
CADOMIN B ASSOC	76	0.85	0.05	62		62	1040	64	6110
CAD ASSOC (OTHER)	5	0.85	0.05	4		4	1040	4	
WABAMUN	1	0.80	0.10	1		1	1070	1	
NISKU	5	0.85	0.35	3		3	1070	3	
REAVERTHILL LAKE	1	0.80	0.15	1		1	1070	1	
BH LK ASSOC	6	0.80	0.15	4		4	1140*	5	
BH LK A SOLN	340	0.42	0.25	110	21	89	1140*	101	
KAYBOB SOUTH									
VIKING A	18	0.65	0.05	11	2	9	1120	10	4400
CADOMIN A	39	0.80	0.05	30	3	27	1070*	29	8390
CADOMIN B	24	0.80	0.05	18		18	1070*	19	5780
CADOMIN C	16	0.80	0.05	12	2	10	1070*	11	5220
CADOMIN (OTHER)	16	0.85	0.05	13	2	11	1070*	12	
TRIASSIC	2	0.80	0.05	2		2	1160*	2	
TRIASSIC A ASSOC	51	0.85	0.15	37		37	1160*	43	3140

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11 12 13 14 15 16 17 18 19 20

AVERAGE PAY THICKNESS FEET	POROSITY FRACTION	LIQUID SATURATION FRACTION	INITIAL PRESSURE PSIA	RESERVOIR TEMPERATURE °F	COMPRESS- IBILITY FACTOR FRACTION	RAW GAS SPECIFIC GRAVITY	AVERAGE WELL DEPTH FEET	DISCOVERY YEAR	DATE LAST REVIEWED, DISPOSITION AND REMARKS
									1961
									1966
									1965
									1965
									1963
19	0.17	0.40	870	100	0.89	0.65	3240	1949	1968
							3250	1949	1971 GAS FLOOD
57	0.20	0.35	1250	100	0.86	0.60	3980	1960	1961
									1961
									1967 LOC U
									1967
									1970
							4610	1959	1970 NUL, A&S, AND
									STORAGE RESERVOIR
							8660	1959	1966 NUL AND A&S
							8640	1959	1971 NUL AND A&S
56	0.20	0.20	1900	155	0.86	0.63	6040	1960	1960
									1970 CWNG
153	0.07	0.15	4250	185	0.92	0.74	10790	1961	1971 CWNG
155	0.07	0.15	4320	190	0.93	0.75	11640	1963	1971 CWNG AND TCPL
136	0.06	0.15	4330	180	0.92	0.74	11340	1967	1971 TCPL
98	0.07	0.15	4340	185	0.91	0.75	11450	1968	1971
13	0.20	0.35	1530	135	0.88	0.61	4710	1957	1967 A&S
							4820	1958	1968 A&S
	0.19	0.35	1390	145	0.88	0.61	5050	1958	1966
									1964
									1964
									1964
17	0.15	0.30	2210	160	0.84	0.72	5800	1957	1964
									1968
									1961
									1961
									1964
							9780	1957	1971 A&S
11	0.14	0.40	1450	150	0.86	0.66	5590	1960	1970 A&S
8	0.15	0.35	2230	180	0.87	0.64	6710	1961	1966 A&S
13	0.15	0.35	2230	180	0.87	0.64	7050	1963	1966
8	0.15	0.35	2230	180	0.87	0.64	6680	1963	1966 A&S
									1967 A&S
									1964
18	0.13	0.10	2480	160	0.78	0.79	6760	1962	1970

TABLE A-1 (CONTINUED) - ESTABLISHED RESERVES OF GAS IN THE PROVINCE

1	2	3	4	5	6	7	8	9	10
POOL OR ZONE	INITIAL GAS IN PLACE BCF	POOL RECOVERY FRACTION	SURFACE LOSS FRACTION	INITIAL MARKETABLE GAS BCF	MARKETABLE GAS PRODUCED JUNE 30/71 BCF	REMAINING MARKETABLE GAS JUNE 30/71 BCF	GROSS HEATING VALUE BTU/CU FT.	REMAINING MARKETABLE GAS AT 1000 BTU BCF	AREA ACRES
1 KAYBOB SOUTH (CONTINUED)									
2 TRIASSIC A SOLN	92	0.40	0.25	28	1	27	1160*	31	
3 NISKU A	19	0.90	0.20	14		14	1160*	16	1200
4									
5 NISKU (OTHER)	1	0.80	0.05	1		1	1160*	1	
6 BEAVERHILL LAKE A	4340	0.85	0.35	2400	10	2390	1090*	2605	58120
7									
8									
9 KILLAM									
10 VIKING	16	0.85	0.05	13		13	1010	13	
11 MANNVILLE	17	0.75	0.05	13		13	1000	13	
12 NISKU	1	0.80	0.05	1		1	1170	1	
13									
14 KILLAM NORTH									
15 MANNVILLE	19	0.80	0.05	15	1	14	1000	14	
16 MANNVILLE ASSOC	5	0.80	0.05	4		4	1000	4	
17									
18 KIRK WALL									
19 VIKING	2	0.80	0.05	2		2	980	2	
20									
21 KITSIM									
22 VIKING	6	0.85	0.05	5		5	1010*	5	
23									
24 KNAPPEN									
25 MANNVILLE	6	0.80	0.05	5		5	1000	5	
26 JURASSIC	5	0.80	0.05	4	1	3	1000	3	
27 MISSISSIPPIAN	7	0.90	0.10	6		6	1000	6	
28									
29 KNELLER									
30 MANNVILLE	11	0.85	0.05	9	4	5	1000	5	
31									
32 KNOXPCIK									
33 DOE CREEK A	18	0.75	0.05	12	1	11	1000	11	4360
34									
35 LAC LA BICHE									
36 MANNVILLE	10	0.80	0.05	8	1	7	1010	7	
37									
38 LAIT									
39 MANNVILLE	11	0.85	0.05	8	2	6	1010	6	
40									
41 LARNE									
42 SLAVE POINT	2	0.90	0.10	1		1	1050*	1	
43 SULPHUR POINT	11	0.85	0.15	8		8	1050*	8	
44 KEG RIVER SOLN	4	0.70	0.25	2		2	1200*	2	
45									
46 LEAHURST									
47 MANNVILLE	25	0.65	0.05	15	3	12	1160*	14	
48									
49 LEDUC-WOODBEND									
50 CARDIUM	12	0.80	0.05	9	7	2	1040	2	
51 VIKING	20	0.80	0.05	15	3	12	1070	13	
52 BLAIRMORE	68	0.80	0.05	53	20	33	1180	39	
53 BLAIRMORE ASSOC	34	0.85	0.05	27		27	1180	32	
54									
55 D-1	2	0.85	0.10	2	2	< 1	1050	< 1	
56 D-1 ASSOC	1	0.85	0.10	1		1	1050	1	
57 D-2 A ASSOC	37	0.90	0.15	28	-12	40	1180	47	9770
58 D-2 A SOLN	130	0.45	0.30	42	66	24	1180	27	
59 D-2 B SOLN	41	0.75	0.30	21	15	6	1180	7	
60									
61 D-3 A ASSOC	410	0.85	0.15	300	-7	307	1180	362	17230
62 D-3 ASSOC (OTHER)	6	0.85	0.15	4	1	3	1180	4	
63 D-3 A SOLN	140	0.70	0.30	70	57	13	1180	15	
64 D-3 SOLN (OTHER)	11	0.70	0.35	5	4	1	1180	1	

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AVERAGE PAY THICKNESS FEET	POROSITY FRACTION	LIQUID SATURATION FRACTION	INITIAL PRESSURE PSIA	RESERVOIR TEMPERATURE °F	COMPRESS- IBILITY FACTOR FRACTION	RAW GAS SPECIFIC GRAVITY	AVERAGE WELL DEPTH FEET	DISCOVERY YEAR	DATE LAST REVIEWED, DISPOSITION AND REMARKS
40	0.05	0.20	4100	225	0.93	0.80	6880 9510	1962 1958	1971 A&S 1963
102	0.08	0.20	4600	240	0.88	1.00	10560	1961	1958 1970 A&S AND POOL BEING CYCLED
									1971 1968 1968
									1966 LOC U 1966
									1969 TCPL
									1971 TCPL
									1966 CMG 1971 CMG 1965
									1968 LOC U
9	0.22	0.30	900	100	0.87	0.66	2920	1964	1966 LOC U
									1968 LOC U
									1971 CMG
									1968 1968 1970
									1969 LOC U
									1967 INJECTED INTO D-2 1959 AND D-3 GAS CAPS 1959 AND SOLD TO NUL 1961
									1969 1966
41	0.02	0.20	1780	150	0.80	0.73	5050 5100 5260	1947 1947 1950	1958 1965 1965
60	0.08	0.15	1890	150	0.83	0.66	5280 5320	1947 1947	1964 1964 1966 1966

TABLE A-1 (CONTINUED) - ESTABLISHED RESERVES OF GAS IN THE PROVINCE

1	2	3	4	5	6	7	8	9	10
POOL OR ZONE	INITIAL GAS IN PLACE BCF	POOL RECOVERY FRACTION	SURFACE LOSS FRACTION	INITIAL MARKETABLE GAS BCF	MARKETABLE GAS PRODUCED JUNE 30/71 BCF	REMAINING MARKETABLE GAS JUNE 30/71 BCF	GROSS HEATING VALUE BTU/CU. FT.	REMAINING MARKETABLE GAS AT 1000 BTU BCF	AREA ACRES
1 LEGAL									
2 MANNVILLE	6	0.75	0.05	4	2	2	1030	2	
3									
4 LINDBERGH									
5 VIKING	4	0.65	0.05	2		2	990	2	
6 MANNVILLE	19	0.80	0.05	14	9	5	1000	5	
7									
8 LITTLE BCW									
9 UPPER MANNVILLE A	20	0.85	0.05	16	5	11	1000	11	3450
10 MANNVILLE (OTHER)	17	0.85	0.05	14	2	12	1000	12	
11 MANNVILLE ASSOC	1	0.85	0.05	1		1	1000	1	
12									
13 LLOYDMINSTER									
14 MANNVILLE	24	0.85	0.30	14	12	2	950	2	
15 MANNVILLE (OTHER)	1	0.75	0.05	1		1	950	1	
16									
17 LONE PINE CREEK									
18 MANNVILLE	2	0.80	0.10	1		1	1020	1	
19 WABAMUN A	490	0.85	0.23	320	30	290	1000	290	33220
20 D-3 A ASSOC	180	0.80	0.25	110**					4470
21 D-3 A SOLN	10	0.65	0.30	5**	9**	106	1060*	112	
22									
23 D-3 ASSOC (OTHER)	9	0.85	0.20	6		6	1060*	6	
24									
25 LONG COULEE									
26 MANNVILLE A	16	0.85	0.25	10	2	8	1000	8	2070
27 MANNVILLE (OTHER)	11	0.85	0.20	7	2	5	1000	5	
28									
29 LOCKOUT BUTTE									
30 RUNDLE A	420	0.80	0.11	300	112	188	1060*	199	
31									
32 LCVETT RIVER									
33 BLAIRMORE	5	0.90	0.05	5		5	1040	5	
34 RUNDLE A	97	0.80	0.10	70		70	1040	73	1100
35									
36 MAJEAU LAKE									
37 MANNVILLE	5	0.85	0.05	4		4	1000	4	
38 BANFF 25-56-4	12	0.90	0.10	10		10	1070	11	500
39 BANFF (OTHER)	2	0.85	0.05	2		2	1070	2	
40									
41 MALMO									
42 VIKING	7	0.85	0.05	6		6	1000	6	
43 BLAIRMORE	6	0.85	0.10	4		4	1030	4	
44 BLAIRMORE ASSOC	2	0.70	0.15	1		1	1030	1	
45 D-2 ASSOC	4	0.80	0.20	3		3	1100	3	
46									
47 D-3 B	42	0.85	0.20	29		29	1100	32	1960
48 D-3 ASSOC	1	0.85	0.15	1		1	1100	1	
49									
50 MANYBERRIES									
51 BOW ISLAND A	28	0.90	0.02	25	21	4	940	4	
52 BOW ISLAND (OTHER)	5	0.65	0.02	3	3	< 1	940	< 1	
53 MANNVILLE	5	0.85	0.05	3		3	1000	3	
54									
55 MARLBORO									
56 LEDUC A	170	0.85	0.30	100		100	1000	100	1920
57									
58 MARSH HEAD CREEK									
59 LEDUC 17-59-20	27	0.85	0.35	15		15	1050	16	500
60									
61 MARTEN HILLS									
62 PELICAN	2	0.65	0.05	1		1	990	1	
63 MANNVILLE (OTHER)	26	0.75	0.05	18	1	17	990	17	
64 WBSK A & WAB A	1110	0.80	0.05	860	64	796	990	788	197530

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11 12 13 14 15 16 17 18 19 20

AVERAGE PAY THICKNESS FEET	POROSITY FRACTION	LIQUID SATURATION FRACTION	INITIAL PRESSURE PSIA	RESERVOIR TEMPERATURE °F	COMPRESS- IBILITY FACTOR FRACTION	RAW GAS SPECIFIC GRAVITY	AVERAGE WELL DEPTH FEET	DISCOVERY YEAR	DATE LAST REVIEWED, DISPOSITION AND REMARKS
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									1955 CIGOL	1
										2
										3
									1961 CANSALT	4
									1962 CANSALT	5
										6
										7
8	0.21	0.40	1680	105	0.82	0.67	3950	1965	1968 TCPL	8
									1968 TCPL	9
									1968	10
										11
										12
									1954 LOC U	13
									1966	14
										15
										16
									1963	17
34	0.06	0.20	3570	180	0.89	0.76	7920	1955	1970 TCPL	18
63	0.08	0.15	3260	180	0.85	0.78	7960	1963	1971	19
									1967 TCPL	20
										21
									1967	22
										23
										24
9	0.20	0.35	1880	105	0.78	0.83	4380	1965	1968 TCPL	25
									1968 TCPL	26
										27
										28
										29
										30
										31
										32
										33
177	0.06	0.20	4950	220	1.01	0.61	11870	1958	1970	34
									1959	35
										36
										37
60	0.09	0.15	1500	125	0.82	0.67	4250	1951	1971	38
									1955	39
									1970	40
										41
										42
									1960	43
									1959	44
									1960	45
									1959	46
46	0.07	0.10	2180	130	0.81	0.76	5310	1959	1966	47
									1966	48
										49
										50
										51
										52
										53
										54
										55
129	0.07	0.10	5050	265	0.97	0.74	12150	1965	1969	56
										57
29	0.07	0.15	4800	245	0.92	0.66	11540	1961	1964	58
										59
										60
										61
									1964	62
									1969 TCPL	63
34	0.21	0.45	390	80	0.95	0.57	2300	1961	1971 TCPL	64

TABLE A-1 (CONTINUED) - ESTABLISHED RESERVES OF GAS IN THE PROVINCE

1	2	3	4	5	6	7	8	9	10
POOL OR ZONE	INITIAL GAS IN PLACE BCF	POOL RECOVERY FRACTION	SURFACE LOSS FRACTION	INITIAL MARKETABLE GAS BCF	MARKETABLE GAS PRODUCED JUNE 30/71 BCF	REMAINING MARKETABLE GAS JUNE 30/71 BCF	GROSS HEATING VALUE BTU/CU FT.	REMAINING MARKETABLE GAS AT 1000 BTU BCF	AREA ACRES
1 MARTEN HILLS (CONTINUED)									
2 WABAMUN (OTHER)	16	0.75	0.05	11		11	1000	11	
3									
4 MATZIWIN									
5 VIKING	11	0.85	0.05	9		9	1050	9	
6 MANNVILLE	1	0.80	0.05	1		1	1050	1	
7									
8 MAZEPPA									
9 RUNDLE 16-19-27	20	0.90	0.15	15		15	1060	16	1100
10 WARAMUN	26	0.85	0.45	12		12	1000	12	
11									
12 MEDICINE HAT									
13 MILK RIVER A	190	0.55	0.05	100	1	99	960	95	149660
14 MILK RIVER (OTHER)	3	0.55	0.05	2		2	960	2	
15 MEDICINE HAT	2550	0.80	0.02	2000	713	1287	970	1248	983680
16 BOW ISLAND	15	0.60	0.05	9	1	8	970	8	
17									
18 JURASSIC	7	0.80	0.05	5	2	3	1000	3	
19									
20 MEDICINE RIVER									
21 BASAL MANNVILLE A	34	0.85	0.15	25		25	1150*	29	3680
22 MANNVILLE (OTHER)	77	0.85	0.15	56	1	55	1150*	63	
23 CSTRACOD B ASSOC	14	0.85	0.15	10		10	1150*	12	3980
24 CSTRACOD C ASSOC	40	0.85	0.15	29**					2900
25									
26 CSTRACOD C SOLN	2	0.60	0.45	1**	7**	23	1150*	26	
27 BASAL QUARTZ B ASSOC	32	0.85	0.15	23		23	1150*	26	2310
28 MANN ASSOC (OTHER)	27	0.85	0.15	20		20	1150*	23	
29 GLAUCONITIC A SOLN	98	0.60	0.45	32		32	1150*	37	
30 MANN SOLN (OTHER)	28	0.50	0.45	7		7	1150*	8	
31									
32 JURASSIC	15	0.85	0.15	11		11	1020*	11	
33 JURASSIC D ASSOC	15	0.80	0.15	10		10	1020*	10	910
34 JUR ASSOC (OTHER)	16	0.80	0.15	11		11	1020*	11	
35 JURASSIC SOLN	70	0.35	0.45	13		13	1020*	13	
36 PEKISKO P	65	0.80	0.11	47	5	42	1100*	46	3220
37									
38 RUNDLE (OTHER)	20	0.85	0.15	14	1	13	1100*	14	
39 RUNDLE ASSOC	9	0.85	0.15	6		6	1100*	7	
40 RUNDLE SOLN	38	0.50	0.45	11		11	1200*	13	
41 LEDUC ASSOC	2	0.85	0.20	1		1	1100*	1	
42									
43 MELLOWDALE									
44 VIKING	1	0.75	0.05	1		1	1000	1	
45									
46 MIKWAN									
47 BELLY RIVER	2	0.70	0.05	2		2	990	2	
48 VIKING B	14	0.75	0.05	10		10	1100	11	9640
49 VIKING (OTHER)	2	0.75	0.05	1		1	1100	1	
50 MANNVILLE	14	0.80	0.05	11		11	1100	12	
51									
52 MILLET									
53 MANNVILLE 1-49-25	25	0.50	0.05	12		12	1020	12	5880
54									
55 MINNEHIK-BUCK LAKE									
56 MANNVILLE	2	0.75	0.05	1		1	1000	1	
57 PEKISKO A	740	0.85	0.12	550	149	401	1110*	445	
58 PEKISKO B	71	0.85	0.10	54	5	49	1110*	54	7620
59									
60 MITSUE									
61 MANNVILLE	3	0.85	0.05	2		2	1070	2	
62 GILWOOD ASSOC	5	0.90	0.25	4		4	1170	5	
63 GILWOOD A SOLN	470	0.50	0.25	180		180	1170	211	

11	12	13	14	15	16	17	18	19	20
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									1971
									1962
									1961
33	0.08	0.20	2700	145	0.81	0.71	6800	1956	1957 1967
12	0.20	0.45	480	60	0.94	0.58	1330	1969	1971 TCPL
8	0.26	0.40	630	60	0.91	0.57	1600	1904	1970 1967 TCPL, MIP, AND LOC U 1964 TCPL
									1968 TCPL
12	0.14	0.30	2640	160	0.81	0.71	7660	1964	1968
5	0.13	0.35	2830	155	0.80	0.76	7010	1955	1968 TCPL
14	0.14	0.25	2930	150	0.79	0.76	7480	1960	1968
19	0.14	0.30	2380	150	0.81	0.72	7040	1959	1965 TCPL
							7400	1964	1968 1968 1969 1968
22	0.15	0.30	2340	145	0.81	0.70	6970	1962	1968 1968 1968 1971
36	0.10	0.25	2380	140	0.79	0.74	6950	1963	1969 TCPL
									1968 TCPL
									1968
									1971
									1968
									1968 LOC U
5	0.14	0.40	1060	120	0.87	0.67	4580	1968	1970 1970 1970 1967
7	0.20	0.30	1500	120	0.79	0.71	4440	1951	1968
									1956
GIP BASED ON MATERIAL BALANCE							6910	1952	1969 A&S
19	0.10	0.25	2490	185	0.85	0.71	7190	1962	1966 A&S
									1968
									1966
							5650	1964	1970

TABLE A-1 (CONTINUED) - ESTABLISHED RESERVES OF GAS IN THE PROVINCE

1	2	3	4	5	6	7	8	9	10
POOL OR ZONE	INITIAL GAS IN PLACE BCF	POOL RECOVERY FRACTION	SURFACE LOSS FRACTION	INITIAL MARKETABLE GAS BCF	MARKETABLE GAS PRODUCED JUNE 30/71 BCF	REMAINING MARKETABLE GAS JUNE 30/71 BCF	GROSS HEATING VALUE BTU/CU. FT.	REMAINING MARKETABLE GAS AT 1000 BTU BCF	AREA ACRES
1 MCOSE									
2 RUNDLE A	86	0.80	0.20	55		55	1000	55	1900
3									
4 MCRINVILLE									
5 VIKING	4	0.75	0.05	3		3	1000	3	
6 LOWER MANNVILLE C	22	0.75	0.08	13	9	4	1070*	4	
7 LOWER MANNVILLE E	21	0.85	0.05	17	12	5	1070*	5	
8 MANNVILLE (OTHER)	45	0.60	0.05	26	10	16	1070*	17	
9									
10 LOWER MANN A ASSOC	52	0.75	0.05	37	17	20	1070*	21	6040
11									
12 MOUNTAIN PARK									
13 TRIASSIC 36-47-22	21	0.85	0.05	17		17	1090	19	1100
14									
15 MURIEL LAKE									
16 MANNVILLE	9	0.75	0.05	6	2	4	1000	4	
17									
18 NEVIS									
19 BLAIRMORE A	64	0.85	0.10	49		49	1000	49	11990
20 BLAIRMORE (OTHER)	2	0.85	0.10	1		1	1000	1	
21 DEVONIAN	1040	0.90	0.15	800	271	529	1000*	529	31000
22									
23 NEW NORWAY									
24 VIKING	3	0.80	0.10	2		2	1000	2	
25 BLAIRMORE	10	0.90	0.05	9		9	1010	9	
26									
27 NIPISI									
28 GILWOOD A SOLN	260	0.43	0.35	72		72	1150	83	
29									
30 NITON									
31 MANNVILLE	6	0.80	0.05	5		5	1070	5	
32 CADOMIN	8	0.90	0.05	7		7	1070	7	
33									
34 NORDEGG									
35 TRIASSIC	9	0.90	0.10	7		7	1000	7	
36 RUNDLE 17-41-17	25	0.90	0.10	20		20	1000	20	2130
37									
38 NORMANDVILLE									
39 PEACE RIVER	1	0.70	0.05	1		1	990	1	
40 GETHING	6	0.70	0.05	4		4	980	4	
41 TRIASSIC	1	0.85	0.05	1		1	1090	1	
42 PERMIAN	2	0.85	0.05	2		2	1060	2	
43									
44 MISSISSIPPIAN A	16	0.85	0.05	13	3	10	1050	11	1410
45 MISS (OTHER)	22	0.85	0.05	18	2	16	1050	17	
46									
47 ORED									
48 VIKING 26-55-22	14	0.85	0.05	12		12	1020	12	1100
49 MANNVILLE	6	0.85	0.10	5		5	1040	5	
50 RUNDLE	4	0.85	0.10	3		3	1050	3	
51 D-2 A	210	0.90	0.35	130		130	1060	138	5290
52									
53 D-2 B	47	0.85	0.35	26		26	1060	28	1100
54									
55 OBERLIN									
56 MANNVILLE	4	0.75	0.05	3	3	< 1	1090	< 1	
57									
58 OKOTOKS									
59 CROSSFIELD	500	0.80	0.55	180	60	120	990	119	22880
60									
61 OLDS									
62 VIKING	3	0.65	0.05	2		2	1040*	2	
63 WABAMUN C	110	0.85	0.25	67	1	66	1010*	67	6330
64 WABAMUN A ASSOC	350	0.85	0.25	220**					31030

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11 12 13 14 15 16 17 18 19 20

AVERAGE PAY THICKNESS FEET	POROSITY FRACTION	LIQUID SATURATION FRACTION	INITIAL PRESSURE PSIA	RESERVOIR TEMPERATURE °F	COMPRESS- IBILITY FACTOR FRACTION	RAW GAS SPECIFIC GRAVITY	AVERAGE WELL DEPTH FEET	DISCOVERY YEAR	DATE LAST REVIEWED, DISPOSITION AND REMARKS
141	0.06	0.15	1870	115	0.77	0.73	7570	1960	1969
									1962
							3690	1951	1969 CIGOL AND LOC U
							3550	1951	1962 CIGOL AND LOC U
									1962 CIGOL AND LOC U
16	0.22	0.30	1140	115	0.87	0.67	3600	1952	1969 CIGOL AND LOC U
36	0.07	0.20	4100	240	0.98	0.62	10120	1956	1969 BER
									1964 LOC U
10	0.22	0.20	1400	130	0.84	0.66	4570	1952	1959
75	0.07	0.15	2340	140	0.81	0.69	5580	1952	1964
									1968 TCPL
									1959
									1959
									1971
									1969
									1963
70	0.04	0.20	1840	125	0.86	0.58	4930	1960	1961 BER
									1961 BER
									1967
									1971 LOC U
									1967
									1967
13	0.27	0.35	1570	100	0.83	0.64	3440	1956	1967 LOC U
									1967 LOC U
15	0.14	0.40	3830	165	0.92	0.62	8080	1966	1967
									1969
									1966
70	0.06	0.20	5580	275	0.98	0.77	13150	1964	1970
84	0.05	0.20	5580	275	0.98	0.77	12890	1969	1970
									1970 LOC U
40	0.06	0.20	3600	175	0.70	0.90	8690	1951	1970 CWNG
									1965
29	0.06	0.15	3610	165	0.83	0.81	8690	1959	1970 TCPL
27	0.05	0.20	3590	165	0.83	0.75	8680	1952	1967

TABLE A-1 (CONTINUED) - ESTABLISHED RESERVES OF GAS IN THE PROVINCE

1	2	3	4	5	6	7	8	9	10
POOL OR ZONE	INITIAL GAS IN PLACE BCF	POOL RECOVERY FRACTION	SURFACE LOSS FRACTION	INITIAL MARKETABLE GAS BCF	MARKETABLE GAS PRODUCED JUNE 30/71 BCF	REMAINING MARKETABLE GAS JUNE 30/71 BCF	GROSS HEATING VALUE BTU/CUB FT.	REMAINING MARKETABLE GAS AT 1000 BTU BCF	AREA ACRES
1 OLDS (CONTINUED)									
2 WABAMUN A SOLN	62	0.65	0.40	24**	66**	178	1010*	180	
3									
4 OPEN CREEK									
5 BASAL QUARTZ A	14	0.85	0.10	11		11	1080*	12	500
6 MANNVILLE (OTHER)	19	0.90	0.15	14		14	1080*	15	
7 JURASSIC	3	0.90	0.15	2		2	1080*	2	
8 RUNDLE	13	0.85	0.10	10		10	1080*	11	
9									
10 QYEN									
11 VIKING A	62	0.80	0.10	44	6	38	990	38	15510
12 VIKING C	13	0.80	0.05	10	7	3	990	3	
13 VIKING (OTHER)	3	0.80	0.05	2		2	990	2	
14 DETRITAL	10	0.85	0.05	8	2	6	1010	6	
15									
16 PADDLE RIVER									
17 JURASSIC-DETRITAL	180	0.80	0.10	130	33	97	1130*	110	30000
18 JURASSIC (OTHER)	2	0.80	0.10	1		1	1130*	1	
19 RUNDLE ASSOC	36	0.85	0.10	27		27	1060	29	9300
20									
21 PAKOWKI LAKE									
22 ROW ISLAND A	17	0.80	0.02	13	10	3	940	3	
23 ROW ISLAND (CTHER)	4	0.85	0.05	3		3	940	3	
24 MANNVILLE	1	0.90	0.05	1		1	1000	1	
25									
26 PARFLESH									
27 VIKING	2	0.80	0.05	2		2	1020*	2	
28 MANNVILLE	8	0.85	0.05	6		6	1030*	6	
29									
30 PARKLAND									
31 RUNDLE	2	0.90	0.15	1	1		1010		
32									
33 PARKLAND NORTH-EAST									
34 RUNDLE 29-15-26'	15	0.85	0.15	11		11	1010	11	2130
35 RUNDLE (OTHER)	5	0.90	0.15	4		4	1010	4	
36									
37 PELICAN									
38 MANNVILLE	18	0.70	0.05	12		12	990	12	
39 MANNVILLE ASSOC	3	0.65	0.05	2		2	990	2	
40									
41 PEMBINA									
42 KEYSTONE BR A	36	0.70	0.05	24	7	17	1070*	18	5700
43 BELLY RIVER (CTHER)	32	0.80	0.05	24		24	1070*	26	
44 BELLY RIVER ASSOC	16	0.80	0.05	14		14	1070*	15	
45 BELLY RIVER SOLN	60	0.40	0.80	9	1	8	1070*	9	
46									
47 CARDIUM SOLN	4100	0.36	0.40	880	194	686	1130*	775	
48 VIKING	11	0.80	0.05	8		8	1130*	9	
49 LOBSTICK GLAUC A	130	0.75	0.06	90	33	57	1120*	64	11110
50 LOBSTICK GLAUC B	65	0.85	0.06	52	11	41	1120*	46	4080
51 LOBSTICK GLAUC C & D	69	0.80	0.06	46	2	44	1120*	49	6290
52									
53 MANNVILLE (OTHER)	18	0.80	0.05	14	4	10	1130*	11	
54 JURASSIC	6	0.85	0.05	5		5	1050*	5	
55 RUNDLE	13	0.85	0.10	10	1	9	1050*	9	
56									
57 PENDANT D'OREILLE									
58 ROW ISLAND	230	0.85	0.05	180	98	82	940	77	52480
59 ROW ISLAND B	20	0.85	0.05	16	8	8	940	8	15090
60 ROW ISLAND (OTHER)	4	0.85	0.05	3		3	940	3	
61 MANNVILLE A	43	0.90	0.05	37	22	15	1000	15	
62									
63 MANNVILLE C	39	0.90	0.05	33	9	24	1000	24	
64 MANNVILLE (OTHER)	26	0.90	0.05	22	3	19	1000	19	

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AVERAGE PAY THICKNESS FEET	POROSITY FRACTION	LIQUID SATURATION FRACTION	INITIAL PRESSURE PSIA	RESERVOIR TEMPERATURE °F	COMPRESS- IBILITY FACTOR FRACTION	RAW GAS SPECIFIC GRAVITY	AVERAGE WELL DEPTH FEET	DISCOVERY YEAR	DATE LAST REVIEWED, DISPOSITION AND REMARKS
							8990	1952	1967 TCPL
38	0.14	0.35	2800	180	0.84	0.71	7190	1967	1968 1968 1971 1968
8	0.28	0.40	970	80	0.89	0.59	2520	1949	1970 TCPL
		GIP BASED ON MATERIAL BALANCE					2570	1951	1969 TCPL 1965 1965 TCPL
22	0.14	0.65	1780	140	0.82	0.70	5060	1956	1969 NUL
14	0.08	0.35	1780	130	0.81	0.82	5090	1956	1969 1966
		GIP BASED ON MATERIAL BALANCE					2200	1947	1970 CMG 1967 1967 1965 1964 TCPL 1970 POOL ABANDONED
16	0.07	0.25	2830	145	0.83	0.66	6940	1953	1963 BER 1956 BER 1968 1964
16	0.19	0.35	1020	100	0.88	0.60	3200	1956	1969 NUL 1965 NUL 1965 1965 NUL
							5080	1953	1967 NUL 1956
26	0.14	0.50	1990	135	0.80	0.69	5970	1957	1970 A&S
22	0.17	0.30	1970	135	0.81	0.69	5640	1958	1970 NUL
19	0.15	0.45	1990	140	0.81	0.66	6110	1959	1970 A&S 1959 A&S 1965 1966 A&S
11	0.23	0.20	730	75	0.92	0.59	2100	1946	1971 CMG
4	0.22	0.25	740	75	0.91	0.59	2150	1954	1970 CMG 1967
		GIP BASED ON MATERIAL BALANCE					2770	1961	1971 CMG
		GIP BASED ON MATERIAL BALANCE					2690	1965	1971 CMG 1971 CMG

TABLE A-1 (CONTINUED) - ESTABLISHED RESERVES OF GAS IN THE PROVINCE

1	2	3	4	5	6	7	8	9	10
POOL OR ZONE	INITIAL GAS IN PLACE BCF	POOL RECOVERY FRACTION	SURFACE LOSS FRACTION	INITIAL MARKETABLE GAS BCF	MARKETABLE GAS PRODUCED JUNE 30/71 BCF	REMAINING MARKETABLE GAS JUNE 30/71 BCF	GROSS HEATING VALUE BTU/CU FT.	REMAINING MARKETABLE GAS AT 1000 BTU BCF	AREA ACRES
1 PENHOLD									
2 VIKING 33-36-28	14	0.90	0.05	12		12	1020	12	1100
3									
4 PINCHER CREEK									
5 RUNDLE A	1840	0.30	0.31	380	271	109	1020*	111	
6									
7 PINE CREEK									
8 WABAMUN	110	0.80	0.45	49	19	30	1050	32	
9 WABAMUN B	150	0.80	0.45	68	35	33	1050	35	9650
10 WABAMUN C	58	0.80	0.35	30	7	23	1050	24	
11 WABAMUN (OTHER)	22	0.85	0.50	10		10	1050	11	
12									
13 D-3	770	0.50	0.35	250	153	97	1000	97	9480
14									
15 PINE NORTH-WEST									
16 RUNDLE	8	0.85	0.10	6		6	1030	6	
17 C-3 A	350	0.65	0.25	170	20	150	980	147	4220
18									
19									
20 PLAIN									
21 VIKING	5	0.80	0.05	4		4	980	4	
22 SPARKY B	20	0.80	0.05	15	1	14	1000	14	6450
23 MANNVILLE (OTHER)	44	0.80	0.05	32	1	31	1000	31	
24 WINTERBURN	11	0.75	0.05	8		8	990*	8	
25									
26 CAMROSE	4	0.75	0.05	3	1	2	990*	2	
27									
28 PCUCE COUPE									
29 PEACE RIVER A	180	0.70	0.05	120	97	23	1000	23	
30 BLUESKY-GETHING	8	0.85	0.05	7		7	1000	7	
31 TRIASSIC	7	0.85	0.05	5		5	1060	5	
32									
33 PCUCE COUPE SOUTH									
34 DOE CREEK	4	0.60	0.05	2	2	< 1	1000	< 1	
35 PEACE RIVER A	34	0.70	0.03	23	20	3	1040	3	
36 PEACE RIVER B	44	0.70	0.02	31	31	< 1	1040	< 1	7160
37 GETHING A	20	0.85	0.05	17	14	3	1000	3	
38									
39 CADOMIN	11	0.85	0.10	9	2	7	1000	7	
40 TRIASSIC	18	0.80	0.05	14		14	1000	14	
41									
42 PREVO									
43 MANNVILLE	5	0.85	0.10	4		4	1020	4	
44 PEKISKO A	44	0.85	0.10	34	10	24	1110*	27	3490
45									
46 PRINCESS									
47 MILK RIVER	1	0.55	0.05	1		1	980*	1	
48 2WS A	60	0.80	0.05	45	7	38	970	37	33310
49 2WS (OTHER)	7	0.80	0.05	5		5	970*	5	
50 BOW ISLAND	6	0.75	0.05	4	4	< 1	1010	< 1	
51									
52 BASAL CGLORADO	17	0.75	0.05	12	6	6	1020*	6	
53 BASAL MANNVILLE A	18	0.90	0.05	15	5	10	1020*	10	1050
54 MANNVILLE (OTHER)	31	0.85	0.05	25	11	14	1020*	14	
55 BASAL MANN E ASSOC	11	0.90	0.05	10	8	2	1020*	2	1690
56 JEFFERSON B	30	0.85	0.05	24	5	19	1030*	20	6960
57									
58 JEFFERSON ASSOC	1	0.85	0.05	1		1	1030*	1	
59									
60 PROCVOST									
61 VIKING	22	0.75	0.05	16		16	1040	17	
62 VIKING A & B ASSOC	1050	0.88	0.02	900**					
63 VIKING A & B SOLN	8	0.25	0.20	2**	356**	546	1040	568	
64 VIKING C,E,& J ASSOC	33	0.70	0.05	22**					27460

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11 12 13 14 15 16 17 18 19 20

AVERAGE PAY THICKNESS FEET	POROSITY FRACTION	LIQUID SATURATION FRACTION	INITIAL PRESSURE PSIA	RESERVOIR TEMPERATURE °F	COMPRESS- IBILITY FACTOR FRACTION	RAW GAS SPECIFIC GRAVITY	AVERAGE WELL DEPTH FEET	DISCOVERY YEAR	DATE LAST REVIEWED, DISPOSITION AND REMARKS
24	0.20	0.30	1710	145	0.89	0.69	5590	1958	1958
PRODUCIBLE BASED ON PRODUCTION DECLINE							12500	1948	1971 TCPL
22	0.07	GIP BASED ON MATERIAL BALANCE				0.83	9928	1957	1970 MAINTAIN
		0.15	4510	210	10410		1956	1967 PRESSURE	
		GIP BASED ON MATERIAL BALANCE					11400	1958	1970 IN 1965 WINDFALL
122	0.07	0.15	4580	235	0.91	0.76	11020	1957	1969 D-3 A
133	0.07	0.10	4650	240	0.95	0.71	10670	1963	1968 1969 MAINTAINS PRESSURE IN WINDFALL D-3 A
8	0.28	0.45	750	75	0.90	0.57	2220	1958	1970 TCPL 1969 TCPL 1971 TCPL 1970 TCPL 1969 TCPL
GIP BASED ON MATERIAL BALANCE							2300	1922	1970 WCOAST 1968 1968
22	0.17	GIP BASED ON MATERIAL BALANCE				0.57	3230	1956	1971 WCOAST AND PRTC
		0.30	800	105	3310		1953	1969 WCOAST AND PRTC	
		GIP BASED ON MATERIAL BALANCE					4980	1958	1969 WCOAST AND PRTC
									1968 WCOAST AND PRTC 1965
25	0.10	0.20	2330	160	0.83	0.69	6630	1958	1966 1966 TCPL
5	0.22	0.40	820	75	0.90	0.58	2190	1963	1971 1967 TCPL 1965 1969 TCPL
23	0.20	0.30	1550	85	0.82	0.61	3180	1940	1966 TCPL 1966 TCPL 1967 TCPL
9	0.20	0.30	1550	85	0.82	0.61	3190	1940	1966 TCPL
14	0.08	0.25	1590	100	0.82	0.62	3940	1940	1965 TCPL
									1965
GIP BASED ON MATERIAL BALANCE							2510	1946	1968 1968 1971 TCPL AND LOC U
4	0.26	0.45	850	90	0.89	0.61	2940	1952	1969

TABLE A-1 (CONTINUED) - ESTABLISHED RESERVES OF GAS IN THE PROVINCE

1	2	3	4	5	6	7	8	9	10
POOL OR ZONE	INITIAL GAS IN PLACE BCF	POOL RECOVERY FRACTION	SURFACE LOSS FRACTION	INITIAL MARKETABLE GAS BCF	MARKETABLE GAS PRODUCED JUNE 30/71 BCF	REMAINING MARKETABLE GAS JUNE 30/71 BCF	GROSS HEATING VALUE BTU/CU FT.	REMAINING MARKETABLE GAS AT 1000 BTU BCF	AREA ACRES
1 PRCVOST (CONTINUED)									
2 VIKING C,E,& J SOLN	39	0.35	0.20	11**	1**	32	1040	33	
3 MANNVILLE	33	0.85	0.05	27	2	25	1000	25	
4									
5 QUIRK CREEK									
6 RUNDLE A	460	0.85	0.20	310	7	303	1080*	327	6920
7									
8 RAINBOW									
9 SLAVE POINT	6	0.90	0.15	4		4	1100*	4	
0 SULPHUR POINT	35	0.85	0.15	26	1	25	1100*	28	
1 SULPHUR POINT ASSCC	5	0.85	0.15	4		4	1100*	4	
2 SULPHUR POINT SOLN	6	0.65	0.20	3		3	1100*	3	
3									
4 MUSKEG	10	0.90	0.15	8	1	7	1120*	8	
5 MUSKEG SOLN	12	0.65	0.30	5		5	1150*	6	
6 KEG RIVER Q	18	0.85	0.10	14		14	1150*	16	160
7 KEG RIVER FFF	19	0.90	0.10	16	2	14	1150*	16	160
8 KEG RIVER (OTHER)	17	0.85	0.15	12		12	1150*	14	
9									
0 KEG RIVER A ASSOC	33	0.85	0.15	24	-20	44	1200*	53	250
1 KEG RIVER F ASSOC	74	0.85	0.90	57	-2	59	1200*	71	2260
2 KR ASSCC (OTHER)	20	0.85	0.10	15	-9	24	1200*	29	
3 KEG RIVER A SOLN	72	0.88	0.20	50	8	42	1260*	53	
4 KEG RIVER B SOLN	91	0.67	0.20	42	5	37	1260*	47	
5									
6 KEG RIVER E SOLN	13	0.85	0.15	10		10	1260*	13	
7 KEG RIVER F SOLN	150	0.75	0.15	97	6	91	1260*	115	
8 KEG RIVER G SOLN	30	0.50	0.25	11	2	9	1260*	11	
9 KEG RIVER AA SOLN	52	0.57	0.20	28	3	25	1260*	32	
0 KEG RIVER EEE SOLN	20	0.90	0.25	13	1	12	1260*	15	
1									
2 KEG R SOLN (OTHER)	160	0.65	0.25	79	2	77	1260*	97	
3									
4 RAINBOW SOUTH									
5 WINTERBURN	2	0.90	0.05	2		2	1060*	2	
6 SULPHUR POINT	37	0.85	0.15	27		27	1100*	30	
7 MUSKEG	15	0.85	0.20	11		11	1100*	12	
8 MUSKEG SOLN	2	0.65	0.25	1		1	1150*	1	
9									
0 KEG RIVER	7	0.85	0.15	5		5	1150*	6	
1 KEG RIVER ASSOC	18	0.85	0.15	13		13	1150*	15	
2 KEG RIVER A SOLN	34	0.75	0.25	19		19	1200*	23	
3 KEG RIVER B SOLN	37	0.51	0.15	16		16	1200*	19	
4 KEG RIVER E SOLN	57	0.75	0.25	32		32	1200*	38	
5									
6 KEG RIVER G SOLN	24	0.75	0.25	13		13	1200*	16	
7 KEG R SOLN (OTHER)	16	0.75	0.25	9		9	1200*	11	
8									
9 RAINIER									
0 MANNVILLE	2	0.85	0.05	1		1	1020*	1	
1									
2 REDLAND									
3 BELLY RIVER	1	0.65	0.05	1		1	1000	1	
4 VIKING	3	0.80	0.05	2		2	1000	2	
5 UPPER MANNVILLE A	31	0.85	0.04	25	7	18	1070	19	
6 MANNVILLE (OTHER)	8	0.85	0.05	7		7	1070	7	
7									
8 REDWATER									
9 VIKING	26	0.75	0.05	19	1	18	1040	19	
0 MANNVILLE	1	0.80	0.05	1	1	< 1	1050	< 1	
1 D-1	4	0.60	0.10	2	2	< 1	1070	< 1	
2 D-3 SOLN	240	0.60	0.65	49	17	32	1220*	39	
3									
4 RED WILLOW									
5 VIKING A	14	0.75	0.05	10		10	1020	10	9660

11	12	13	14	15	16	17	18	19	20
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AVERAGE PAY THICKNESS FEET	POROSITY FRACTION	LIQUID SATURATION FRACTION	INITIAL PRESSURE PSIA	RESERVOIR TEMPERATURE °F	COMPRESS- IBILITY FACTOR FRACTION	RAW GAS SPECIFIC GRAVITY	AVERAGE WELL DEPTH FEET	DISCOVERY YEAR	DATE LAST REVIEWED, DISPOSITION AND REMARKS
							2950	1952	1971 TCPL 1961 TCPL
133	0.08	0.20	2280	120	0.74	0.77	6340	1967	1971 TCPL
									1967 1967 1967 1971 INJ INTO GAS CAP
									1967 1971 INJ INTO GAS CAP
248	0.07	0.10	2400	170	0.85	0.70	5740	1966	1968
396	0.05	0.20	2570	140	0.80	0.70	6110	1967	1968 1967 INJ INTO GAS CAP
171	0.11	0.06	2570	180	0.82	0.78	6020	1965	1969
79	0.07	0.15	2480	180	0.70	0.70	5870	1966	1967 1967 INJ INTO GAS CAP
							6380	1965	1971 INJ INTO GAS CAP
							5970	1965	1971 INJ INTO GAS CAP
							5930	1966	1971
							6080	1966	1967 INJ INTO GAS CAP
							6050	1966	1969 INJ INTO GAS CAP
							5530	1967	1971 INJ INTO GAS CAP
							6090	1968	1970 INJ INTO GAS CAP
									1971 INJ INTO GAS CAP
									1967 1967 1967 1971
									1967 1967
							6380	1965	1967
							6450	1966	1971
							6440	1966	1969
							6390	1967	1968 1971
									1971 TCPL
									1966 1961
		GIP BASED ON MATERIAL BALANCE					4870	1961	1969 CWNG 1961 CWNG
									1965 CIGOL AND LOC U 1960 CIGOL AND LOC U 1971 CIGOL AND LOC U
							3210	1948	1965 CIGOL AND LOC U
5	0.20	0.45	900	105	0.91	0.60	3220	1955	1971

TABLE A-1 (CONTINUED) - ESTABLISHED RESERVES OF GAS IN THE PROVINCE

1	2	3	4	5	6	7	8	9	10
POOL OR ZONE	INITIAL GAS IN PLACE BCF	POOL RECOVERY FRACTION	SURFACE LOSS FRACTION	INITIAL MARKETABLE GAS BCF	MARKETABLE GAS PRODUCED JUNE 30/71 BCF	REMAINING MARKETABLE GAS JUNE 30/71 BCF	GROSS HEATING VALUE BTU/CU BT	REMAINING MARKETABLE GAS AT 1000 BTU BCF	AREA ACRES
RED WILLOW (CONTINUED)									
VIKING (OTHER)	2	0.80	0.05	2		2	1020	2	
MANNVILLE	22	0.80	0.05	17		17	1050	18	
RETLAW									
BOW ISLAND	8	0.80	0.05	6	1	5	950	5	
HASAL COLORADO	8	0.75	0.05	6		6	1020	6	
MANNVILLE B & D	35	0.90	0.10	30	10	20	1000	20	
MANNVILLE J	21	0.90	0.05	18	1	17	1000	17	1250
MANNVILLE K	14	0.90	0.15	11		11	1000	11	1250
MANNVILLE (OTHER)	32	0.85	0.10	24		24	1000	24	
MANNVILLE ASSOC	6	0.85	0.15	5		5	1000	5	
RUNDLE	4	0.90	0.10	3		3	1010	3	
RICH									
LOWER MANNVILLE A	16	0.85	0.10	12	2	10	1100	11	3810
RICHDALE									
VIKING A & C	24	0.85	0.05	18	3	15	1010	15	8060
MANNVILLE	13	0.85	0.05	11		11	1050	12	
RICINUS									
CARDIUM I	18	0.90	0.15	14		14	1000	14	500
CARDIUM (OTHER)	4	0.85	0.15	3		3	1000	3	
CARDIUM A ASSOC	300	0.85	0.15	220		220	1000	220	5090
CARD ASSOC (OTHER)	9	0.85	0.05	7		7	1000	7	
D-3 A	350	0.85	0.40	180		180	1010	182	1480
RICINUS WEST									
D-3 A	2140	0.85	0.45	1000		1000	1010	1010	6460
ROCHESTER									
VIKING	1	0.75	0.05	1		1	1000	1	
MANNVILLE	21	0.80	0.05	16		16	1000	16	
WABAMUN	6	0.90	0.05	5		5	1070	5	
ROCKYFORD									
MANNVILLE	4	0.80	0.10	3		3	1070	3	
ROWLEY									
BILLY RIVER	6	0.80	0.05	4		4	1000	4	
VIKING	8	0.85	0.05	6		6	1040	6	
MANNVILLE	12	0.85	0.05	10		10	1070	11	
MANNVILLE ASSOC	5	0.85	0.10	4		4	1070	4	
PEKISKO A ASSOC	47	0.90	0.10	38**					6780
PEKISKO A SOLN	8	0.65	0.25	4**	13**	29	1100*	32	
RYCROFT									
BLUESKY	7	0.80	0.05	5	4	1	1040	1	
GETHING	5	0.85	0.05	4	1	3	1040	3	
SADDLE HILLS									
CADOTTE D	37	0.70	0.05	25		25	1020	26	5380
PEACE RIVER (OTHER)	11	0.70	0.05	7		7	1020	7	
GETHING	6	0.80	0.05	4		4	980	4	
BELLOY A	22	0.80	0.15	15		15	1030	15	1050
ST. ALBERT-BIG LAKE									
VIKING	1	0.80	0.05	1		1	1070*	1	
VIKING ASSOC	2	0.80	0.05	1		1	1070*	1	
OSTRACOD A	98	0.85	0.05	80	71	9	1070*	10	

OF ALBERTA, JUNE 30, 1971 (14.65 PSIA AND 60°F.)

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AVERAGE PAY THICKNESS FEET	POROSITY FRACTION	LIQUID SATURATION FRACTION	INITIAL PRESSURE PSIA	RESERVOIR TEMPERATURE °F	COMPRESS- IBILITY FACTOR FRACTION	RAW GAS SPECIFIC GRAVITY	AVERAGE WELL DEPTH FEET	DISCOVERY YEAR	DATE LAST REVIEWED, DISPOSITION AND REMARKS
									1962
									1969
									1968 TCPL
									1965
									1970 TCPL
23	0.21	0.40	1710	95	0.81	0.71	3570	1959	1967 TCPL
							3120	1966	
8	0.29	0.15	1650	85	0.79	0.71	3550	1954	1969
									1968
									1970
									1966
13	0.12	0.30	1270	135	0.87	0.65	4790	1953	1961 TCPL
8	0.22	0.50	1090	115	0.87	0.61	3030	1955	1971 TCPL
									1968 TCPL
26	0.13	0.10	3940	155	0.83	0.83	8900	1969	1970
42	0.14	0.10	3940	175	0.85	0.83	8770	1969	1971
									1970
238	0.08	0.10	5890	225	0.96	0.78	13710	1968	1970
409	0.07	0.10	5770	250	0.97	0.82	14710	1969	1970
									1953 BER
									1953 BER
									1953 BER
									1971 TCPL
									1964
									1966
									1964
									1965
22	0.08	0.20	1500	120	0.82	0.71	4420	1960	1965
									1967 TCPL
									1961 LOC U
									1961 LOC U
17	0.21	0.30	930	115	0.92	0.57	3630	1957	1965
									1965
									1965
35	0.10	0.25	2600	155	0.82	0.65	6970	1957	1965
									1965
									1957
									1966 CIGOL

GIP BASED ON MATERIAL BALANCE

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1952

1966 CIGOL

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TABLE A-1 (CONTINUED) - ESTABLISHED RESERVES OF GAS IN THE PROVINCE

1	2	3	4	5	6	7	8	9	10
POOL OR ZONE	INITIAL GAS IN PLACE BCF	POOL RECOVERY FRACTION	SURFACE LOSS FRACTION	INITIAL MARKETABLE GAS BCF	MARKETABLE GAS PRODUCED JUNE 30/71 BCF	REMAINING MARKETABLE GAS JUNE 30/71 BCF	GROSS HEATING VALUE BTU/CU FT.	REMAINING MARKETABLE GAS AT 1000 BTU BCF	AREA ACRES
1 ST. ALBERT-BIG LAKE (CONTINUED)									
2 BASAL QUARTZ B	26	0.85	0.05	21		21	1070*	22	1060
3									
4 MANNVILLE (OTHER)	6	0.85	0.05	5		5	1070*	5	
5									
6 ST. PAUL									
7 MANNVILLE	7	0.80	0.05	5	5	< 1	1000	< 1	
8									
9 SAMSON									
10 BELLY RIVER	3	0.80	0.05	2		2	1000	2	
11 BLAIRMORE	1	0.85	0.05	1	1	< 1	1070*	< 1	
12 BLAIRMORE ASSOC	9	0.80	0.05	7**					
13 BLAIRMORE SOLN	2	0.65	0.05	1**	6**	2	1070*	2	
14									
15 SARCEE									
16 RUNDLE A	190	0.85	0.12	140	57	83	1050*	87	
17									
18 SAVANNA CREEK									
19 RUNDLE A	230	0.67	0.30	110	39	71	1020	72	5450
20									
21 SCANDIA									
22 BCW ISLAND	4	0.85	0.05	3		3	1000*	3	
23 LOWER MANNVILLE A	13	0.85	0.05	10		10	1020*	10	2100
24									
25 SEDALIA									
26 VIKING A	110	0.50	0.08	50	10	40	1020*	41	35680
27 VIKING (OTHER)	3	0.80	0.05	2		2	1020	2	
28 MANNVILLE	9	0.85	0.05	7	1	6	1010	6	
29									
30 SECGEWICK									
31 VIKING	3	0.75	0.05	2		2	1000	2	
32 BASAL MANNVILLE A	20	0.85	0.05	16	1	15	1010*	15	2310
33 MANNVILLE (OTHER)	9	0.85	0.05	7		7	1010*	7	
34									
35 SEIU LAKE									
36 VIKING	1	0.75	0.05	1		1	1000	1	
37 MANNVILLE	14	0.85	0.05	11	2	9	1000	9	
38									
39 SEPTEMBER LAKE									
40 MANNVILLE	12	0.75	0.05	8		8	1030	8	
41 MANNVILLE ASSOC	1	0.75	0.05	1		1	1030	1	
42 WABAMUN	2	0.75	0.05	1		1	940	1	
43									
44 SEXSMITH									
45 DUNVEGAN	8	0.80	0.05	6	2	4	1000	4	
46									
47 SIBBALD									
48 VIKING A	37	0.80	0.05	28	16	12	1000	12	
49 VIKING (OTHER)	2	0.80	0.05	2		2	1000	2	
50 BASAL COLORADO A	13	0.80	0.05	10		10	990	10	4210
51 PANFF	1	0.80	0.05	1		1	1050	1	
52									
53 SIMONETTE									
54 PEACE RIVER	9	0.90	0.05	7		7	1050	7	
55 CADOMIN A	13	0.85	0.05	10		10	1060	11	1500
56 WABAMUN A	34	0.85	0.35	19		19	1070	20	250
57 WABAMUN (OTHER)	14	0.85	0.35	8		8	1070	9	
58									
59 D-3 SOLN	270	0.55	0.40	89	7	82	1120*	92	
60									
61 SMITH COULEE									
62 BOW ISLAND A	45	0.85	0.05	36	26	10	930	9	
63									
64 STANDARD									
65 VIKING A	26	0.80	0.05	20	1	19	1000	19	4210

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TABLE A-1 (CONTINUED) - ESTABLISHED RESERVES OF GAS IN THE PROVINCE

1	2	3	4	5	6	7	8	9	10
POOL OR ZONE	INITIAL GAS IN PLACE BCF	POOL RECOVERY FRACTION	SURFACE LOSS FRACTION	INITIAL MARKETABLE GAS BCF	MARKETABLE GAS PRODUCED JUNE 30/71 BCF	REMAINING MARKETABLE GAS JUNE 30/71 BCF	GROSS HEATING VALUE BTU/CUB FT.	REMAINING MARKETABLE GAS AT 1000 BTU BCF	AREA ACRES
1 STANMORE									
2 VIKING A & B	82	0.80	0.05	61	1	60	1000	60	16990
3 UPPER MANNVILLE A	14	0.85	0.05	11		11	1050	12	2280
4									
5 STEEP CREEK									
6 GETHING	6	0.85	0.05	5		5	1020	5	
7 TRIASSIC	9	0.85	0.10	7		7	1030	7	
8 PERMO-PENN 26-66-7	17	0.90	0.20	12		12	1030	12	1100
9									
10 STETTLER									
11 VIKING	3	0.75	0.05	2		2	1020	2	
12 D-2 SOLN	21	0.41	0.90	1		1	1130	1	
13 D-3 SOLN	15	0.60	0.95	1		1	1140	1	
14									
15 STETTLER NORTH									
16 MANNVILLE	4	0.80	0.05	3		3	1090	3	
17									
18 STIRLING									
19 BOW ISLAND A	16	0.80	0.05	12	1	11	920*	10	9590
20									
21 STOLBERG									
22 RUNDLE A	86	0.90	0.10	70		70	1040	73	1480
23									
24 STRACHAN									
25 D-3 A	2420	0.88	0.20	1700	23	1677	1090	1828	5190
26 D-3 B	85	0.88	0.20	60		60	1090	65	1520
27									
28 STRATHMORE									
29 BELLY RIVER	14	0.80	0.05	11	5	6	990*	6	
30 VIKING	9	0.80	0.05	7		7	1000	7	
31 RUNDLE	2	0.80	0.05	1		1	1000	1	
32									
33 STROME									
34 MANNVILLE	9	0.85	0.10	7		7	1030	7	
35									
36 STURGEON LAKE									
37 GETHING	13	0.85	0.05	10		10	1000	10	
38 GILWOOD	1	0.85	0.15	1		1	1000	1	
39									
40 STURGEON LAKE SOUTH									
41 GETHING	18	0.85	0.10	14		14	1000	14	
42 TRIASSIC ASSOC	3	0.85	0.10	2		2	1180	2	
43 TRIASSIC SOLN	22	0.65	0.70	4		4	1180	5	
44 PERMO-PENN	11	0.85	0.05	9		9	1030	9	
45									
46 D-1	4	0.90	0.20	3	1	2	1070	2	
47 D-3 ASSOC	10	0.90	0.25	7		7	1080	8	
48 D-3 SOLN	270	0.55	0.45	83	21	62	1100*	68	
49									
50 SUNDRE									
51 BASAL MANNVILLE A	15	0.90	0.10	12		12	1020	12	500
52 MANNVILLE (OTHER)	6	0.85	0.10	4	1	3	1020	3	
53 RUNDLE A ASSOC	21	0.85	0.15	15		15	1060*	16	1660
54 RUNDLE A SOLN	59	0.40	0.50	12	7	5	1060*	5	
55									
56 RUNDLE SOLN (OTHER)	8	0.35	0.50	1	1	< 1	1060*	< 1	
57									
58 SUNNYNOCK									
59 VIKING	1	0.75	0.05	1		1	1020	1	
60 MANNVILLE	16	0.85	0.05	13	1	12	1020	12	
61									
62 SUPERBA									
63 VIKING	2	0.75	0.05	1	1	< 1	990	< 1	

OF ALBERTA, JUNE 30, 1971 (14.65 PSIA AND 60°F.)

11 12 13 14 15 16 17 18 19 20

AVERAGE PAY THICKNESS FEET	POROSITY FRACTION	LIQUID SATURATION FRACTION	INITIAL PRESSURE PSIA	RESERVOIR TEMPERATURE °F	COMPRESS- IBILITY FACTOR FRACTION	RAW GAS SPECIFIC GRAVITY	AVERAGE WELL DEPTH FEET	DISCOVERY YEAR	DATE LAST REVIEWED, DISPOSITION AND REMARKS
8	0.27	0.40	1060	90	0.87	0.61	2870	1961	1971 TCPL
11	0.24	0.40	1260	90	0.90	0.65	3340	1970	1970 TCPL
35	0.06	0.30	4350	240	0.91	0.66	10470	1956	1961 BER 1961 BER 1961 BER 1963 CWNG 1971 CWNG 1971 CWNG 1970 LOC U
8	0.20	0.35	485	80	0.94	0.58	2580	1957	1970 CWNG
122	0.05	0.20	5100	200	0.99	0.64	12730	1957	1958
414	0.09	0.10	7150	255	1.15	0.74	13490	1967	1970
169	0.03	0.20	7140	255	1.15	0.74	13450	1969	1970 1963 CWNG 1963 1963 1969 LOC U 1967 BER 1967 BER 1967 CUL 1967 1969 CUL 1968 1967 CUL 1961 8500 1953 1965 A&S AND CUL
32	0.12	0.25	4000	190	0.89	0.76	8820	1957	1971 1964 TCPL
16	0.10	0.20	3670	200	0.90	0.65	9040 9050	1955 1955	1964 1965 A&S 1971 A&S 1966 1966 TCPL 1970 TCPL

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TABLE A-1 (CONTINUED) - ESTABLISHED RESERVES OF GAS IN THE PROVINCE

1	2	3	4	5	6	7	8	9	10
POOL OR ZONE	INITIAL GAS IN PLACE BCF	POOL RECOVERY FRACTION	SURFACE LOSS FRACTION	INITIAL MARKETABLE GAS BCF	MARKETABLE GAS PRODUCED JUNE 30/71 BCF	REMAINING MARKETABLE GAS JUNE 30/71 BCF	GROSS HEATING VALUE BTU/CU FT	REMAINING MARKETABLE GAS AT 1000 BTU BCF	AREA ACRES
1 SWALWELL									
2 VIKING	6	0.80	0.05	5		5	1000	5	
3 PEKISKO A ASSOC	43	0.85	0.05	35		35	1100	39	4000
4 WINTERBURN ASSOC	1	0.85	0.15	1		1	1160	1	
5									
6 SWAN HILLS									
7 GETHING	2	0.90	0.05	1		1	1050	1	
8 BH LK A & B SOLN	1070	0.45	0.35	310	34	276	1200*	331	
9									
10 SWAN HILLS SOUTH									
11 BH LK A & B SOLN	570	0.45	0.30	180	27	153	1120*	171	
12									
13 SYLVAN LAKE									
14 VIKING	6	0.85	0.05	5		5	1010*	5	
15 GLAUCONITIC A	210	0.85	0.05	170	59	111	1100*	122	9290
16 CSTRACOD B	29	0.85	0.12	22	3	19	1100*	21	2230
17 LOWER MANNVILLE A	35	0.85	0.09	27	10	17	1100*	19	2830
18									
19 LOWER MANNVILLE C	32	0.85	0.09	25	14	11	1100*	12	
20 LOWER MANNVILLE C	28	0.85	0.06	23	3	20	1100*	22	2620
21 MANNVILLE (OTHER)	39	0.85	0.10	29		29	1100*	32	
22 MANNVILLE ASSOC	3	0.80	0.15	2		2	1100*	2	
23 JURASSIC L	14	0.85	0.15	10		10	1020*	10	1130
24									
25 JURASSIC (OTHER)	14	0.85	0.10	11	2	9	1020*	9	
26 JURASSIC A ASSOC	46	0.80	0.10	33		33	1020*	34	3010
27 JUR ASSOC (OTHER)	3	0.85	0.10	2		2	1020*	2	
28 JURASSIC SOLN	23	0.60	0.45	8		8	1100*	9	
29 ELKTON-SHUNDA A	24	0.85	0.10	18	11	7	1100*	8	3380
30									
31 SHUNDA B	22	0.85	0.15	16		16	1100*	18	1790
32 RUNDLE (OTHER)	31	0.85	0.15	22		22	1100*	24	
33 PEKISKO B ASSOC	18	0.80	0.15	13		13	1100*	14	1410
34 RUNDLE ASSOC (OTHER)	7	0.80	0.15	5		5	1100*	6	
35 PEKISKO B SOLN	26	0.60	0.35	10		10	1200*	12	
36									
37 RUNDLE SOLN (OTHER)	16	0.60	0.35	6		6	1200*	7	
38 D-3 A ASSOC	40	0.80	0.11	29**					1800
39 D-3 A SOLN	15	0.65	0.45	5**	5**	29	1020*	30	
40									
41 TABER SOUTH									
42 BOW ISLAND A	17	0.70	0.05	11		11	1000	11	12410
43 BOW ISLAND (OTHER)	7	0.75	0.05	5		5	1000	5	
44									
45 TANGENT									
46 PEACE RIVER	12	0.75	0.05	9		9	1000	9	
47 GETHING	42	0.85	0.05	34		34	1000	34	
48 TRIASSIC	25	0.85	0.05	20		20	1010	20	
49									
50 TEHZE									
51 SULPHUR POINT SOLN	1	0.65	0.25	1		1	1100*	1	
52 MUSKEG SOLN	1	0.65	0.25	1		1	1150*	1	
53 KEG RIVER SOLN	16	0.70	0.25	8		8	1260*	10	
54									
55 TELFORDVILLE									
56 MISSISSIPPIAN	10	0.85	0.10	8		8	1110	9	
57 WABAMUN	6	0.85	0.15	4		4	1090	4	
58									
59 THORHILD									
60 MANNVILLE A	12	0.85	0.05	10		10	1000	10	2550
61 MANNVILLE (OTHER)	1	0.85	0.05	1		1	1000	1	
62									
63 THREE HILLS CREEK									
64 BELLY RIVER	3	0.80	0.05	2		2	970	2	

OF ALBERTA, JUNE 30, 1971 (14.65 PSIA AND 60°F.)

11	12	13	14	15	16	17	18	19	20
AVERAGE PAY THICKNESS FEET	POROSITY FRACTION	LIQUID SATURATION FRACTION	INITIAL PRESSURE PSIA	RESERVOIR TEMPERATURE °F	COMPRESS- IBILITY FACTOR FRACTION	RAW GAS SPECIFIC GRAVITY	AVERAGE WELL DEPTH FEET	DISCOVERY YEAR	DATE LAST REVIEWED, DISPOSITION AND REMARKS
32	0.08	0.25	1790	145	0.83	0.69	5330	1963	1966 1966 TCPL 1969
							8290	1957	1962 1971 NUL
							8350	1959	1971 NUL
31	0.13	0.30	2430	145	0.79	0.73	6950	1953	1971 TCPL
13	0.17	0.30	2950	160	0.83	0.68	7790	1963	1969 TCPL
18	0.13	0.30	2480	150	0.81	0.70	7150	1955	1969 TCPL
		GIP BASED ON MATERIAL BALANCE					7140	1953	1971 TCPL
16	0.13	0.30	2410	145	0.81	0.73	6890	1953	1969 TCPL
									1969 TCPL
16	0.14	0.30	2440	150	0.80	0.70	7250	1962	1969
									1969 TCPL
21	0.14	0.30	2500	160	0.83	0.69	7410	1962	1969
									1969
17	0.07	0.25	2430	150	0.80	0.70	7150	1955	1965
23	0.10	0.25	2450	150	0.81	0.70	7180	1953	1969 TCPL
									1969
16	0.14	0.25	2460	150	0.80	0.71	7260	1962	1969
							7320	1962	1969
									1965
41	0.07	0.15	3470	210	0.90	0.70	9400	1961	1969
									1964 TCPL
6	0.20	0.30	540	80	0.94	0.60	2280	1963	1965 BER
									1961 BER
									1968
									1968
									1968
									1969
									1969
									1969
									1957
									1966
12	0.25	0.30	740	85	0.91	0.60	2570	1963	1966 LOC U
									1964
									1963

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TABLE A-1 (CONTINUED) - ESTABLISHED RESERVES OF GAS IN THE PROVINCE

1	2	3	4	5	6	7	8	9	10
POOL OR ZONE	INITIAL GAS IN PLACE BCF	POOL RECOVERY FRACTION	SURFACE LOSS FRACTION	INITIAL MARKETABLE GAS BCF	MARKETABLE GAS PRODUCED JUNE 30/71 BCF	REMAINING MARKETABLE GAS JUNE 30/71 BCF	GROSS HEATING VALUE BTU/CU.FT.	REMAINING MARKETABLE GAS AT 1000 BTU BCF	AREA ACRES
1 THREE HILLS CREEK (CONTINUED)									
2 VIKING	8	0.80	0.05	6		6	1000	6	
3 PEKISKO ASSOC	140	0.60	0.05	80	31	49	1130*	55	
4									
5 TROCHU									
6 MANNVILLE	19	0.80	0.10	14		14	1150	16	
7									
8 TURIN									
9 BOW ISLAND	14	0.80	0.05	10		10	970	10	
10 MANNVILLE	17	0.90	0.15	13		13	1020	13	
11 MANNVILLE ASSOC	10	0.85	0.15	7		7	1020	7	
12									
13 TURNER VALLEY									
14 RUNDLE ASSOC	1570	0.90	0.70	410	307	103	1110*	114	
15 RUNDLE SOLN	1400	0.55	0.55	350	292	58	1110*	64	
16									
17 TWEEDIE									
18 VIKING	14	0.80	0.05	10	3	7	1000	7	
19 GRAND RAPIDS A	15	0.80	0.05	11	3	8	1040	8	9290
20 GLAUC A & MCMURRAY A	63	0.80	0.05	48	8	40	1040	42	26350
21 MANNVILLE (OTHER)	7	0.80	0.05	5	1	4	1040	4	
22									
23 TWINING NORTH									
24 RUNDLE	3	0.80	0.05	2		2	1110	2	
25 RUNDLE ASSOC	37	0.80	0.05	28		28	1110	31	4340
26 RUNDLE SOLN	15	0.60	0.15	8		8	1110	9	
27									
28 TWO CREEK									
29 TRIASSIC 11-63-16	12	0.90	0.05	10		10	1090	11	850
30									
31 UKALTA									
32 MANNVILLE	3	0.75	0.05	2		2	1020	2	
33 WABAMUN-GRAMINIA A	42	0.75	0.05	30	1	29	990*	29	7000
34									
35 USONA									
36 MANNVILLE 11-45-27	12	0.90	0.05	10		10	1110	11	470
37									
38 VERGER									
39 BOW ISLAND	6	0.80	0.05	4	1	3	1100	3	
40 BASAL CCLORADO	29	0.85	0.05	22	5	17	1010	17	
41 MANNVILLE	21	0.80	0.05	16	3	13	1050	14	
42 RUNDLE	2	0.85	0.05	2		2	1070	2	
43									
44 VIKING-KINSELLA									
45 VIKING	960	0.85	0.05	770	448	322	1000	322	408000
46 WAINWRIGHT	21	0.80	0.05	16	5	11	1000	11	
47 MANNVILLE (OTHER)	36	0.80	0.05	27	17	10	1000	10	
48 D-2	13	0.85	0.05	11	2	9	990*	9	
49									
50 CAMROSE	10	0.80	0.05	7	4	3	990*	3	
51									
52 VIRGINIA HILLS									
53 MANNVILLE	9	0.90	0.05	8		8	1040	8	
54 BELLOY A	63	0.80	0.10	45	1	44	1060	47	5290
55 BH LK ASSOC	4	0.80	0.20	2		2	1070*	2	
56 BEAVERHILL LAKE SOLN	220	0.40	0.40	53	9	44	1070*	47	
57									
58 VIRGO									
59 SLAVE POINT	11	0.90	0.10	9		9	1050*	9	
60 SULPHUR POINT	33	0.90	0.15	25		25	1050*	26	
61 MUSKEG	13	0.90	0.15	10		10	1050*	11	
62 MUSKEG ASSOC	7	0.85	0.15	5		5	1050*	5	
63									
64 MUSKEG SOLN	3	0.60	0.25	2		2	1100*	2	

OF ALBERTA, JUNE 30, 1971 (14.65 PSIA AND 60°F.)

11 12 13 14 15 16 17 18 19 20

AVERAGE PAY THICKNESS FEET	POROSITY FRACTION	LIQUID SATURATION FRACTION	INITIAL PRESSURE PSIA	RESERVOIR TEMPERATURE °F	COMPRESS- IBILITY FACTOR FRACTION	RAW GAS SPECIFIC GRAVITY	AVERAGE WELL DEPTH FEET	DISCOVERY YEAR	DATE LAST REVIEWED, DISPOSITION AND REMARKS
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GIP BASED ON MATERIAL BALANCE

5770 1953 1963 TCPL

1968

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1968

1968

6000 1928 1953 CWNG AND LOC U
8390 1928 1953 CWNG AND LOC U

1968 GCOS

1969 GCOS

1971 GCOS

1968 GCOS

1964

1964

1965

1956 BER

1969

1969 TCPL

1955 BER

1964 TCPL

1971 TCPL

1968 TCPL

1964 TCPL

1966 NUL AND LOC U

1970 NUL

1966 NUL

1971 NUL

1961 NUL

1962

1970 A&S

1962

1970 NUL AND A&S

1968

1968

1968

1968

1971

TABLE A-1 (CONTINUED) - ESTABLISHED RESERVES OF GAS IN THE PROVINCE

1	2	3	4	5	6	7	8	9	10
POOL OR ZONE	INITIAL GAS IN PLACE BCF	POOL RECOVERY FRACTION	SURFACE LOSS FRACTION	INITIAL MARKETABLE GAS BCF	MARKETABLE GAS PRODUCED JUNE 30/71 BCF	REMAINING MARKETABLE GAS JUNE 30/71 BCF	GROSS HEATING VALUE BTU/CU-FT	REMAINING MARKETABLE GAS AT 1000 BTU BCF	AREA ACRES
1 VIRGO (CONTINUED)									
2 KEG RIVER	10	0.85	0.15	8		8	1100*	9	
3 KEG RIVER HH ASSOC	13	0.90	0.20	10		10	1150*	12	160
4 KEG R ASSOC (OTHER)	68	0.90	0.20	50		50	1150*	58	
5 KEG RIVER SOLN	80	0.70	0.20	43		43	1200*	52	
6									
7 VULCAN									
8 U MANN B & RSL MANN A	17	0.85	0.15	13	3	10	1050	11	2320
9 MANNVILLE (OTHER)	3	0.85	0.15	2	1	1	1050	1	
10 TURNER VALLEY A	19	0.60	0.20	9	1	8	1050	8	3220
11 RUNDLE (OTHER)	4	0.80	0.20	2		2	1050	2	
12									
13 WAINWRIGHT									
14 VIKING	5	0.80	0.05	4		4	980	4	
15 MANNVILLE	18	0.85	0.05	14	1	13	940	12	
16 MANNVILLE ASSOC	7	0.75	0.05	5		5	940	5	
17									
18 WARWICK									
19 VIKING	5	0.80	0.05	4		4	980	4	
20 MANNVILLE	26	0.80	0.05	19	2	17	1000	17	
21 WINTERBURN	18	0.80	0.05	13	1	12	990*	12	
22									
23 WASKAHIGAN									
24 CARDIUM	3	0.80	0.05	2		2	1060	2	
25 DUNVEGAN A ASSOC	130	0.80	0.05	90	5	85	1120*	95	26980
26 PEACE RIVER	5	0.85	0.05	4		4	1070	4	
27									
28 WATERTON									
29 RUNDLE A & H	80	0.80	0.30	45	5	40	1040*	42	
30 RUNDLE C	350	0.75	0.45	150	14	136	1040*	141	13390
31 RUNDLE D & E	470	0.80	0.50	190	48	142	1040*	148	
32 RUNDLE I	21	0.85	0.30	12		12	1040*	12	500
33									
34 RUNDLE (OTHER)	4	0.85	0.30	2		2	1040*	2	
35 RUNDLE-WABAMUN A	2990	0.85	0.33	1700	237	1463	1050*	1536	
36 WABAMUN B	38	0.80	0.20	25	11	14	960	13	
37 WABAMUN 31-6-3	40	0.85	0.15	29		29	1020	30	2000
38									
39 WATTS									
40 VIKING	5	0.85	0.07	4	2	2	1030*	2	
41 MISSISSIPPIAN	1	0.80	0.05	1		1	1070	1	
42									
43 WAYNE-ROSEDALE									
44 BELLY RIVER	9	0.75	0.05	7	3	4	1000	4	
45 VIKING A	170	0.80	0.05	130	37	93	1090*	101	51750
46 VIKING B	24	0.80	0.05	18	6	12	1090*	13	9940
47 VIKING (OTHER)	26	0.80	0.05	20	1	19	1090*	21	
48									
49 GLAUCONITIC A	110	0.85	0.07	85	38	47	1120	53	
50 MANNVILLE (OTHER)	95	0.80	0.05	71	15	56	1120	63	
51 MANNVILLE ASSOC	8	0.80	0.05	6	1	5	1120	6	
52									
53 WEST DRUMHELLER									
54 MANNVILLE	4	0.90	0.05	3		3	1100	3	
55 RUNDLE	1	0.80	0.05	1		1	1040	1	
56 D-2 ASSOC	5	0.85	0.15	4		4	1090	4	
57									
58 WESTEROSE									
59 MANNVILLE	7	0.80	0.05	5		5	1020	5	
60 NISKU	2	0.90	0.05	1		1	1050	1	
61 D-3 ASSOC	130	0.90	0.20	90**					1220
62 D-3 SOLN	150	0.70	0.20	83**	6**	167	1050*	175	
63									
64 WESTEROSE SOUTH									
65 WABAMUN	8	0.90	0.25	6		6	1090	7	

11	12	13	14	15	16	17	18	19	20
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TABLE A-1 (CONTINUED) - ESTABLISHED RESERVES OF GAS IN THE PROVINCE

1	2	3	4	5	6	7	8	9	10
POOL OR ZONE	INITIAL GAS IN PLACE BCF	POOL RECOVERY FRACTION	SURFACE LOSS FRACTION	INITIAL MARKETABLE GAS BCF	MARKETABLE GAS PRODUCED JUNE 30/71 BCF	REMAINING MARKETABLE GAS JUNE 30/71 BCF	GROSS HEATING VALUE BTU/CU. FT.	REMAINING MARKETABLE GAS AT 1000 BTU BCF	AREA ACRES
1 WESTEROSE SOUTH (CONTINUED)									
2 D-3 A	1850	0.90	0.20	1350	539	811	1060*	860	11790
3									
4 WESTLOCK									
5 VIKING	430	0.80	0.05	330	99	231	1060	245	
6 VIKING (OTHER)	7	0.80	0.05	5		5	1060	5	
7 MANNVILLE	4	0.85	0.05	3		3	1100*	3	
8									
9 WEST PRAIRIE									
10 CADOTTE 18-72-17	17	0.90	0.05	15		15	1040	16	1100
1 BLUESKY	6	0.90	0.05	5		5	990	5	
2									
3 WHISKEY									
4 RUNDLE A	160	0.85	0.25	100		100	1110*	111	2130
5									
6 WHITECOURT									
7 BELLY RIVER	2	0.85	0.05	1		1	1000	1	
8 MANNVILLE	7	0.80	0.05	5		5	1050	5	
9 CADOMIN	8	0.85	0.05	7		7	1050	7	
10 JURASSIC E	43	0.85	0.05	35	6	29	1070	31	5560
11									
12 JURASSIC F	12	0.85	0.05	10		10	1070	11	2230
13 JURASSIC (OTHER)	14	0.85	0.05	11	7	4	1070	4	
14 PEKISKO E	37	0.85	0.05	30	3	27	1130	31	4620
15 RUNDLE (OTHER)	22	0.80	0.10	17		17	1130	19	
16									
17 WHITELAW									
18 BLUESKY & GETHING	18	0.85	0.05	15	6	9	1020	9	
19 TRIASSIC A	21	0.85	0.05	16		16	1090	17	5680
20 TRIASSIC (OTHER)	10	0.90	0.05	9		9	1090	10	
21									
22 WILDCAT HILLS									
23 RUNDLE A	1050	0.80	0.17	700	207	493	1040*	513	
24									
25 WILDHORSE CREEK									
26 RUNDLE A	160	0.85	0.20	110	3	107	1010	108	1960
27									
28 WILDMERE									
29 MANNVILLE	32	0.80	0.05	25	11	14	960*	13	
30									
31 WILDUNN CREEK									
32 VIKING A	19	0.60	0.05	11	1	10	1030*	10	8810
33 VIKING B	16	0.70	0.05	11	4	7	1030*	7	4080
34									
35 WILLESDEN GREEN									
36 BELLY RIVER E	38	0.85	0.10	29		29	1070	31	3790
37 BELLY RIVER (OTHER)	26	0.80	0.05	19		19	1070	20	
38 CARDIUM A ASSOC	40	0.85	0.10	31**					8490
39 CARDIUM A SOLN	690	0.35	0.60	91**	12**	110	1040*	114	
40									
41 MANNVILLE	19	0.85	0.15	14		14	1100	15	
42 MANNVILLE ASSOC	8	0.85	0.10	6		6	1100	7	
43 JURASSIC	2	0.75	0.05	1		1	1080	1	
44 RUNDLE	3	0.80	0.05	2		2	1100	2	
45									
46 WILLINGDON									
47 VIKING	6	0.85	0.05	4		4	980	4	
48 MANNVILLE	16	0.75	0.05	12	4	8	990	8	
49 D-3	12	0.75	0.05	8	8	< 1	1000*	< 1	
50									
51 WILSON CREEK									
52 PEKISKO A	51	0.85	0.10	39	5	34	1120*	38	7900
53 BANFF A	18	0.85	0.15	14		14	1120*	16	1100

OF ALBERTA, JUNE 30, 1971 (14.65 PSIA AND 60°F.)

11 12 13 14 15 16 17 18 19 20

AVERAGE PAY THICKNESS FEET	POROSITY FRACTION	LIQUID SATURATION FRACTION	INITIAL PRESSURE PSIA	RESERVOIR TEMPERATURE °F	COMPRESS- IBILITY FACTOR FRACTION	RAW GAS SPECIFIC GRAVITY	AVERAGE WELL DEPTH FEET	DISCOVERY YEAR	DATE LAST REVIEWED, DISPOSITION AND REMARKS
249	0.09	0.10	2750	180	0.81	0.81	7640	1953	1969 TCPL
GIP BASED ON MATERIAL BALANCE							2600	1948	1970 CIGOL & LOC U 1964 1962
35	0.20	0.30	990	85	0.87	0.68	2580	1956	1956 BER 1956 BER
136	0.06	0.25	3820	150	0.83	0.72	11820	1968	1969 1963 1956 1971
18	0.17	0.50	1860	150	0.86	0.65	5070	1962	1971 TCPL
13	0.17	0.50	1870	145	0.84	0.66	5390	1968	1971
24	0.09	0.35	1860	150	0.86	0.64	5220	1968	1971 TCPL 1971 TCPL 1971
5	0.21	0.30	1430	105	0.82	0.58	3270	1951	1970 LOC U 1966 1957
GIP BASED ON MATERIAL BALANCE							9880	1958	1969 A&S
123	0.08	0.15	3200	140	0.85	0.68	7380	1960	1968 A&S AND TCPL 1971 NUL
4	0.25	0.40	1110	90	0.86	0.61	3030	1952	1967 TCPL
7	0.25	0.40	1130	90	0.87	0.59	3090	1952	1967 TCPL
16	0.15	0.25	1600	110	0.78	0.70	5050	1959	1971 1965
6	0.10	0.25	3010	135	0.81	0.69	5980 6190	1954 1954	1970 1971 A&S 1962 1965 1970 1956 1971 WML 1961 LOC U 1971 WML
19	0.06	0.25	2800	190	0.87	0.68	7040	1960	1966 A&S
43	0.07	0.25	2640	165	0.80	0.69	7200	1961	1970 A&S

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TABLE A-1 (CONTINUED) - ESTABLISHED RESERVES OF GAS IN THE PROVINCE

1	2	3	4	5	6	7	8	9	10
POOL OR ZONE	INITIAL GAS IN PLACE BCF	POOL RECOVERY FRACTION	SURFACE LOSS FRACTION	INITIAL MARKETABLE GAS BCF	MARKETABLE GAS PRODUCED JUNE 30/71 BCF	REMAINING MARKETABLE GAS JUNE 30/71 BCF	GROSS HEATING VALUE BTU/CU. FT.	REMAINING MARKETABLE GAS AT 1000 BTU BCF	AREA ACRES
WIMBORNE									
BELLY RIVER	6	0.90	0.05	5		5	970	5	
VIKING	2	0.75	0.05	1		1	1020	1	
RUNDLE	2	0.90	0.10	1		1	1100	1	
D-2 ASSOC	6	0.85	0.15	4		4	1160	5	
D-3 A ASSOC	370	0.70	0.25	220**					15190
D-3 A SOLN	110	0.27	0.32	20**	70**	170	1000*	170	
WINDFALL									
VIKING A	17	0.75	0.05	12		12	1030	12	9980
BANFF	5	0.85	0.05	4	1	3	1040	3	
D-3 A ASSOC	710	0.80	0.30	400**					11600
D-3 A SOLN	190	0.70	0.35	88**	89**	399	1080*	431	
WINNIFRED									
BCW ISLAND A	25	0.85	0.05	20	1	19	1000	19	22340
BOW ISLAND (CTHER)	1	0.80	0.05	1		1	1000	1	
WINTERING HILLS									
BELLY RIVER	2	0.75	0.05	1	1	< 1	1000	< 1	
VIKING D	12	0.90	0.05	10		10	1010	10	1100
VIKING (OTHER)	19	0.80	0.05	15	4	11	1010	11	
VIKING ASSOC	2	0.85	0.05	1		1	1010	1	
MANNVILLE	23	0.80	0.10	17	2	15	1090	16	
LOWER MANN E ASSOC	17	0.75	0.10	12	2	10	1090	11	2850
MANN ASSCC (OTHER)	5	0.80	0.05	4		4	1090	4	
RUNDLE	2	0.80	0.05	1		1	1090	1	
WIZARD LAKE									
BELLY RIVER	2	0.75	0.05	1		1	1050	1	
VIKING	1	0.85	0.05	1		1	1070	1	
PASAL QUARTZ A	13	0.90	0.19	10	9	1	1120	1	
MANNVILLE (OTHER)	7	0.85	0.15	5	2	3	1120	3	
D-2 ASSOC	1	0.85	0.20	1		1	1180	1	
D-2 SOLN	2	0.60	0.60	1		1	1180	1	
D-3 A SOLN	240	0.84	0.25	150	23	127	1250	159	
WCKING									
CADOTTE A	14	0.75	0.05	10	1	9	1040	9	1980
PEACE RIVER (OTHER)	8	0.75	0.05	6		6	1040	6	
SPIRIT RIVER	3	0.80	0.05	2		2	1040	2	
BLUESKY	4	0.80	0.05	3	1	2	1040	2	
PERMO-PENN	2	0.80	0.05	2		2	1060	2	
WCOD RIVER									
MANNVILLE	30	0.85	0.10	23	12	11	1100	12	
WORSLEY									
D-3 A	27	0.85	0.07	21	18	3	950*	3	
D-3 B	29	0.85	0.07	23	19	4	950*	4	
D-3 D	56	0.80	0.10	40	35	5	950*	5	1410
D-3 E	16	0.85	0.05	13	5	8	950*	8	500
D-3 G	65	0.35	0.05	22	21	1	950*	1	3700
D-3 H	20	0.80	0.05	15		15	950	14	540
D-3 (OTHER)	1	0.85	0.05	1	1	< 1	950*	< 1	
D-3 ASSCC	1	0.80	0.05	1		1	950*	1	
YEKAU LAKE									
VIKING	8	0.80	0.02	7	2	5	1070	5	

OF ALBERTA, JUNE 30, 1971 (14.65 PSIA AND 60°F.)

11 12 13 14 15 16 17 18 19 20

AVERAGE PAY THICKNESS FEET	POROSITY FRACTION	LIQUID SATURATION FRACTION	INITIAL PRESSURE PSIA	RESERVOIR TEMPERATURE °F	COMPRESS- IBILITY FACTOR FRACTION	RAW GAS SPECIFIC GRAVITY	AVERAGE WELL DEPTH FEET	DISCOVERY YEAR	DATE LAST REVIEWED, DISPOSITION AND REMARKS
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									1963	1
									1956	2
									1961	3
									1970	4
										5
41	0.08	0.10	3010	175	0.83	0.78	7480 7490	1956 1956	1971 1971 TCPL	6
6	0.08	0.20	1570	145	0.87	0.63	5120	1955	1963 A&S	7
116	0.06	0.15	3790	220	0.83	0.81	8500 8620	1955 1955	1961 A&S 1967 A&S - PRESSURE 1971 MAINTAINED WITH PINE CREEK & PINE NW GAS	8
4	0.20	0.40	730	85	0.92	0.59	2160	1963	1970 TCPL & LOC U 1969	9
19	0.20	0.30	1280	90	0.86	0.65	3130	1955	1963 TCPL 1965 1971 TCPL 1969	10
13	0.17	0.35	1410	105	0.80	0.70	4110	1966	1968 TCPL 1968 TCPL 1966 1963	11
GIP BASED ON MATERIAL BALANCE							4780	1951	1966 1960 NUL 1969 NUL 1959 NUL	12
							6460	1951	1968 1968 1971 NUL	13
15	0.24	0.30	900	100	0.91	0.56	3350	1958	1971 LOC U 1971 LOC U 1961 1961 LOC U 1961	14
									1961 TCPL	15
GIP BASED ON MATERIAL BALANCE							7430	1960	1969 WCOAST	16
GIP BASED ON MATERIAL BALANCE							7260	1960	1966 WCOAST	17
60	0.10	0.20	3090	180	0.89	0.73	7030	1961	1970 WCOAST	18
42	0.11	0.20	3060	170	0.91	0.67	7630	1966	1966 WCOAST	19
42	0.06	0.20	3300	180	0.91	0.64	7290	1959	1971 WCOAST	20
65	0.09	0.20	3280	200	0.93	0.65	7930	1969	1969 WCOAST 1971 WCOAST 1965	21
									1969 INJECTED INTO LEDUC-WCOASTBEND	22

TABLE A-1 (CONTINUED) - ESTABLISHED RESERVES OF GAS IN THE PROVINCE

1	2	3	4	5	6	7	8	9	10
POOL OR ZONE	INITIAL GAS IN PLACE BCF	POOL RECOVERY FRACTION	SURFACE LOSS FRACTION	INITIAL MARKETABLE GAS BCF	MARKETABLE GAS PRODUCED JUNE 30/71 BCF	REMAINING MARKETABLE GAS JUNE 30/71 BCF	GROSS HEATING VALUE BTU/CU FT	REMAINING MARKETABLE GAS AT 1000 BTU BCF	AREA ACRES
1 ZAMA									
2 SLAVE POINT	74	0.90	0.15	58		58	1050*	61	
3 SULPHUR POINT	270	0.85	0.15	190		190	1050*	200	
4 SULPHUR POINT ASSCC	9	0.85	0.15	6		6	1050*	6	
5 SULPHUR POINT SOLN	4	0.60	0.25	2		2	1100*	2	
6									
7 MUSKEG SOLN	8	0.60	0.25	4		4	1100*	4	
8 KEG RIVER 1-116-7	18	0.85	0.20	12		12	1150*	14	160
9 KEG RIVER (OTHER)	29	0.85	0.30	18		18	1150*	21	
10 KEG RIVER ASSOC	15	0.85	0.55	7		7	1150*	8	
11 KEG RIVER SOLN	110	0.65	0.25	54		54	1200*	65	
12									
13 SUB TOTAL	94669			56392	12020	44372		46917	
14									
15 OTHER RESERVES									
16									
17									
18									
19 LESS THAN 10 BCF	1136			677		677		711	
20 CONFIDENTIAL POOLS	1254			747		747		784	
21									
22 TOTAL RESERVES	97059			57816	12020	45796		48412	
23									
24									
25									
26 WITHIN ECONOMIC REACH	95630			56965	12020	44945		47527	
27 BEYOND ECONOMIC REACH	1429			851		851		885	

< MEANS LESS THAN

* MEASURED HIGHER HEATING VALUE

** INCLUDES ASSOCIATED GAS PRODUCTION

11	12	13	14	15	16	17	18	19	20
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AVERAGE PAY THICKNESS FEET	POROSITY FRACTION	LIQUID SATURATION FRACTION	INITIAL PRESSURE PSIA	RESERVOIR TEMPERATURE °F	COMPRESS- IBILITY FACTOR FRACTION	RAW GAS SPECIFIC GRAVITY	AVERAGE WELL DEPTH FEET	DISCOVERY YEAR	DATE LAST REVIEWED, DISPOSITION AND REMARKS
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224	0.08	0.10	2220	150	0.83	0.72	5130	1970
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ABBREVIATIONS USED IN RESERVES TABLE A-1

A & S	Alberta and Southern Gas Co. Ltd.
BAROID	Baroid of Canada, Ltd.
BER	Considered Beyond Economic Reach
CANSALT	The Canadian Salt Company
CFB, COLD LAKE	Canadian Forces Base at Cold Lake
CIGOL	Canadian Industrial Gas & Oil Ltd.
CMG	Canadian-Montana Gas Company Limited
CPL	Calgary Power Ltd.
CUL	Canadian Utilities, Limited
CWNG	Canadian Western Natural Gas Company Limited
ELG	Edmonton Liquid Gas Ltd.
GCOS	Great Canadian Oil Sands Limited
LOC EX PROJECT	Local Experimental Project
LOC U	Local Utility
MIP	Many Islands Pipe Lines Limited
NCO	North Canadian Oils Limited
NUL	Northwestern Utilities, Limited
PRTC	Peace River Transmission Company Limited
PWGE	Plains-Western Gas & Electric Co. Ltd.
SAPL	Southern Alberta Pipe Lines Ltd.
TCPL	Trans-Canada Pipe Lines Limited
WCOAST	Westcoast Transmission Company Limited
WML	Western Minerals Ltd.

APPENDIX B

THE FUTURE RESERVES TO BE CONSIDERED

The method adopted by the Board for determination of the future gas reserves to be considered in the calculation of the future surplus is described in Board Report OGCB 69-D⁽¹⁾. It involves estimates of the Province's ultimate and initial marketable reserves, and the rate of growth of initial marketable reserves over the past ten years. More recent trends in reserves growth must also be given consideration in instances where several years of less than average growth rate is experienced at the end of the ten-year period.

TransCanada and the Board have both used the Board's previous estimate of ultimate reserves of 100 Tcf. As discussed in Appendix A, TransCanada estimated the initial marketable reserves at March 31, 1971, to be 58.8 Tcf, and the Board's estimate as of June 30, 1971, was 57.8 Tcf. These estimates, together with published Board reserve estimates of ten years ago were used by TransCanada and the Board to establish respective ten-year growth rates of 2.7 and 2.4 Tcf per year.

The Board has compared these growth rate estimates with the more recent growth picture and finds that the growth rate was somewhat less in the past 1½ years, being about 1.9 Tcf

(1) Report and Decision on Review of Policies and Procedures for Considering Applications under The Gas Resources Preservation Act, 1956. October, 1969.

per year. The Board considers this to be a normal variance and has accepted the use of the ten-year reserves growth rate in its future reserves determination at this time.

The years of growth to be used to calculate future reserves are determined by taking one-tenth of the difference between the current estimates of ultimate and initial marketable reserves and rounding the resulting answer to the nearest half year. Using the reserves discussed above, both TransCanada and the Board have determined that 4.0 years of growth should be used.

Multiplying the growth rate of 2.7 Tcf per year by the 4.0 years of growth, TransCanada arrived at its estimate of future reserves of 10.8 Tcf. The Board calculates the future reserves to be $4.0 \times 2.4 = 9.6$ Tcf.

APPENDIX C

ALBERTA GAS REQUIREMENTS AND PRESENT PERMIT COMMITMENTS

Views of TransCanada

TransCanada estimated Alberta's 30-year gas requirements by adopting the Board's forecast outlined in Table V-1 of OGCB Report 71-B⁽¹⁾ adjusted for the new 30-year period commencing July 1, 1971. The 30-year Alberta residential, commercial, industrial and contingent requirements were estimated to be 14.2 Tcf. The applicant also allowed 2.3 Tcf for permit related fuel and shrinkage resulting in a total requirement of 16.5 Tcf. TransCanada estimated the outstanding permit commitments to total 31.6 Tcf as of June 30, 1971.

Views of the Board

(1) Alberta Requirements

The Board has not undertaken a comprehensive review of its previous forecast of Alberta gas requirements prepared in 1970 and published in OGCB Report 71-B. Rather, the Board has decided to adjust those components of the 1970 forecast where it appeared warranted in the light of historical consumption and to reflect the new 30-year period commencing July 1, 1971. The comparison between the actual reported volumes and the Board's forecast for 1970 follows:

(1) Report and Decision regarding Alberta's Future Requirements for Gas. February 1971.

Alberta Gas Consumption: 1970
(Bcf of 1,000 Btu Gas)

<u>Demand Category</u>	<u>Board Forecast</u>	<u>Actual</u>	<u>Error Bcf⁽³⁾</u>	<u>Error Per Cent⁽⁴⁾</u>
Residential	58.0	59.2 ⁽¹⁾	-1.2	2.0
Commercial	51.1	54.3 ⁽¹⁾	-3.2	5.9
Industrial and Contingent	128.1	133.8	-5.7	4.3
Operating Require- ments of Gas Utility Companies	2.6	2.7 ⁽²⁾	-0.1	4.1
Permit Related	65.3	71.3	-6.0	8.4
Total	305.1	321.3	-16.2	5.0

(1) Adjusted to a normal degree day basis.

(2) 1.1 per cent of the adjusted actual residential, commercial and industrial requirements.

(3) Forecast minus actual.

(4) Error/actual.

Residential Requirements. Actual consumption of gas, adjusted for degree day changes, by the Province's residential sector totalled 59.2 Bcf in 1970, some 1.2 Bcf greater than the Board's projection of such requirements. The Board believes the error in its forecast of 1970 residential requirements is attributable to a reporting change introduced by the public utilities. The effect of this change has been to identify as residential sales, certain gas deliveries which previously would have been classified as commercial. The Board believes that the long term growth trend as outlined in OGCB Report 71-B remains valid.

In view of this conclusion and the close relationship observed between the adjusted actual 1970 consumption and its forecast of 1971 requirements outlined in OGCB Report 71-B, the Board has advanced the forecast one year. As shown in Table C-1, the Board estimates that Alberta's residential gas requirements will total some 2,705 Bcf over the 30-year forecast period.

Commercial Requirements. The actual commercial gas requirements in 1970, adjusted for degree day changes correspond very closely with the Board's forecast of 1972 commercial gas requirements. The Board has not been able to relate this error to any significant development. However, it believes that the long term growth trend as outlined in OGCB Report 71-B remains valid despite the acceleration of per capita consumption experienced in 1970. On this basis the Board has advanced the forecast by two years. As shown in Table C-1, the total 30-year requirements total 2,715 Bcf.

Industrial and Contingent. As shown in the above comparison for 1970, total industrial and contingent gas requirements exceeded the Board's forecast of such requirements by 5.7 Bcf. For 1970, the Board's estimate of the general industrial gas requirements was accurate. However, a significant discrepancy occurred between the actual and forecast gas requirements for electric energy generation. Discussions with industry indicate that the increase in gas requirements for electric energy generation during 1970 is attributable to difficulties exper-

perienced on the Calgary Power Ltd. System. The Board recognizes the fact that similar circumstances could recur in any given year but believes its previous forecast of contingency requirements will be sufficient to meet any yearly deviations. On this basis, the Board had decided not to adjust its forecast of industrial and contingent gas requirements, as outlined in OGCB Report 71-B, except to relate the forecast to the new 30-year period.

Operating Requirements. The Board's summary of operating requirements of gas utility companies is outlined in Table C-1. The operating requirements, estimated to be 1.1 per cent of the non-permit related requirements, have been adjusted to allow for Board changes in the residential and commercial gas requirements and to reflect the new 30-year period commencing July 1, 1971.

Total Alberta Requirements. The Board estimates the total non-permit related requirements of the Province to be some 14,562 Bcf for the new 30-year period commencing July 1, 1971.

Permit Related Requirements. The actual 1970 permit-related gas requirements exceeded the Board's forecast by 6 Bcf. The Board has examined its forecast of permit related requirements outlined in OGCB Report 71-B and has decided to modify it on the basis of new information received. Despite the fact

that a number of changes to individual requirements have been made, the effect on the yearly requirements is minor. As shown in Table C-1, the Board estimates the 30-year permit related gas requirements to total some 1,995 Bcf.

(2) Permit Commitments

The present permit commitments of the Province are listed in Table C-2. The remaining authorized withdrawals associated with these permits were determined as of June 30, 1971 and are estimated to total 31.4 Tcf, equivalent to 31.8 Tcf of 1,000 Btu gas, for the period commencing July 1, 1971.

TABLE C-1

SUMMARY OF BOARD FORECAST OF ALBERTA GAS REQUIREMENTS
 FOR PERIOD JULY 1, 1971 TO JUNE 30, 2001
 (Billions of Cubic Feet of 1,000 Btu Gas)

	<u>Board</u>
Residential	
1971 Annual (1)	62.4
2000 Annual	114.1
30-year Total	2,705
Commercial	
1971 Annual	57.4
2000 Annual	121.6
30-year Total	2,715
Industrial & Contingent	
1971 Annual	135.0
2000 Annual	429.3
30-year Total	8,984
Operating Requirements	
1971 Annual	2.8
2000 Annual	7.2
30-year Total	158
Permit Related	
1971 Annual	102.0
2000 Annual	1.3
30-year	1,995
Total	
1971 Annual	359.6
2000 Annual	673.5
30-year Total	16,557
Equivalent Average Annual Growth Rate to Achieve Terminal Year (%)	2.4
Equivalent Average Annual Growth Rate to Achieve 30-Year Total (%)	2.9

(1) Throughout, the identified year refers to the period July 1 of the indicated year to June 30 of the immediately succeeding year.

PERMIT COMMITMENTS

(ALL VOLUMES AT 14.65 Psia AND 60°F)

PERMIT NUMBER	PERMITTEE AND FIELDS UNDER PERMIT	TERMINAL DATE OF PERMIT	PERMITTED WITHDRAWALS MAXIMUM DAY MMCF	PERMITTED WITHDRAWALS MAXIMUM ANNUAL BCF	TOTAL BCF	WITHDRAWN TO JUNE 30, 1971 BCF	REMAINING AUTHORIZED WITHDRAWAL BCF
AS 71-6	ALBERTA AND SOUTHERN GAS CO. LTD. BELLOY, BERLAND RIVER, BIGORAY, BIGSTONE, BRAZEAU RIVER, CAROLINE, CARSON CREEK, CARSON CREEK NORTH, CROSSFIELD (RUNDLE A POOL), DUNVEGAN, EAGLESHAM, FERRIER (VIKING A AND CARDIUM B POOLS), FOX CREEK, GILBY, GOLD CREEK, HARMATTAN-ELKTON (RUNDLE C AND D-3A POOLS), HOMEGLLEN-RIMBEY, HUNTER VALLEY, JUDY CREEK, KAYBOB, KAYBOB SOUTH (VIKING A, CADOMIN A, CADOMIN B, CADOMIN C, CADOMIN D, TRIASSIC A AND BEAVERHILL LAKE A POOLS), MARLBORO, MEDICINE RIVER, MINNEHIK-BUCK LAKE, OPEN CREEK, PEMBINA (LOBSTICK GLAUCONITIC A, LOBSTICK GLAUCONITIC C, LOBSTICK GLAUCONITIC D, LOBSTICK OSTRACOD A, LOBSTICK OSTRACOD B AND PEKISKO B POOLS), PINE CREEK, PINE NORTH-WEST, QUIRK CREEK, RICINUS, RICINUS WEST, SIMONETTE, STURGEON LAKE SOUTH, SUNDRE, SWAN HILLS, SWAN HILLS SOUTH, SLYVAN LAKE, TANGENT, VIRGINIA HILLS, WASKAHIGAN, WATERTON, WESTEROSE SOUTH, WESTWARD HO, WILDCAT HILLS, WILDHORSE CREEK, WILLESSEN GREEN, WILSON CREEK AND WINDFALL.	31/10/95	1,503.4	496.0	11,253.0	1,993.3	9,259.7
CD 63-1	CANADIAN DELHI OIL LTD. MEDICINE HAT	30/4/88	4.3	1.57	32.3	5.3	27.0
CM 54-1 AND CM 61-2	CANADIAN-MONTANA PIPELINE COMPANY ADEN, BLACK BUTTE, COMREY, KNAPPEN, LAIT, MANYBERRIES, PAKOWKI LAKE, PENDANT O'REILLE, AND SMITH COULEE.	15/3/86	100.0	20.0	558.0 ⁽¹⁾	279.6	278.4
CP 63-1	CANADIAN PACIFIC OIL AND GAS LIMITED MEDICINE HAT	30/4/88	0.1	0.365	0.750	0.171	0.579

(1) TOTAL INITIAL MARKETABLE GAS IN THE FIELDS SHOWN

TABLE C-2 (CONTINUED)

PERMIT COMMITMENTS

(ALL VOLUMES AT 14.65 PSIA AND 60°F)

PERMIT NUMBER	PERMITTEE AND FIELDS UNDER PERMIT	TERMINAL DATE OF PERMIT	PERMITTED WITHDRAWALS		WITHDRAWN TO JUNE 30, 1971 Bcf	REMAINING AUTHORIZED WITHDRAWAL Bcf
			MMcf	MAXIMUM ANNUAL Bcf		
CNG 69-1	CONSOLIDATED NATURAL GAS LIMITED CRAIGEND, DONALDA, GALAHAD, HALKIRK, KAYBOB SOUTH (BEAVERHILL LAKE A POOL), LEAHURST, MATZIWIN, MIKWAN, RED WILLOW, RICINUS, RICINUS WEST AND STRACHAN.	31/10/96	440.0	140.0	2,531.0	2,531.0
BH 61-1	DELTA GAS & TRANSMISSION LTD.					
BS 61-1	BAILEY SELBURN OIL AND GAS LTD.					
CS 61-1	THE CALIFORNIA STANDARD COMPANY					
COG 61-1	CHARTER OIL AND GAS LTD.	30/6/86	9.5	3.5	71.0	71.0
SEL 61-1	SELBAY EXPLORATION LTD.					
JMW 61-1	J. MERRIL WRIGHT, JR.					
CEL 61-1	CROWFOOT EXPLORATION LTD.					
CMM 61-1	IMPERIAL OIL DEVELOPMENTS LIMITED					
MOG 61-1	MIC MAC OILS (1963) LTD.	30/6/86	8.512	3.1068	62.0	48.6
ROC 61-1	ATLANTIC RICHFIELD COMPANY				13.4	
ROC 65-2	RICHFIELD OIL CORPORATION MEDICINE HAT	31/5/90	0.26	0.088	2.0	1.8
HB 63-1	HUDSON'S BAY OIL AND GAS COMPANY LIMITED MEDICINE HAT	30/4/88	1.02	0.372	7.65	6.86
IOL 71-1	IMPERIAL OIL LIMITED BOUNDARY LAKE SOUTH (TRIASSIC E POOL)	30/4/96	6.0	2.2	17.9	17.9

TABLE C-2 (CONTINUED)

PERMIT COMMITMENTS

(ALL VOLUMES AT 14.65 Psia AND 60°F)

PERMIT NUMBER	PERMITTEE AND FIELDS UNDER PERMIT	TERMINAL DATE OF PERMIT	PERMITTED WITHDRAWALS MAXIMUM DAY MMCF	MAXIMUM ANNUAL BOF	TOTAL BOF	WITHDRAWN TO JUNE 30, 1971 BOF	REMAINING AUTHORIZED WITHDRAWAL BOF
SPC 57-1	MANY ISLANDS PIPE LINES LTD. MEDICINE HAT	31/12/84	135.55	44.53	609.4	257.4	352.0
MO 66-1	MURPHY OIL COMPANY LTD. RED COULEE	31/5/86	0.6	-	0.5	-	0.5
NSU 64-1	THE BRITISH AMERICAN OIL COMPANY LIMITED, ROYALITE OIL COMPANY, LIMITED, SUN OIL COMPANY AND UNITED CANSO OIL & GAS LTD. ANTELOPE AND ESTHER	30/9/89	11.4	4.2	40.0	14.5	25.5
MOC 70-1	MOBIL OIL CANADA, LTD. MOBIL OVEN 10-4-30-2	31/1/90	2.0	0.73	4.69	0.38	4.31
	PEACE RIVER TRANSMISSION COMPANY LIMITED POUCE COUPE	13/7/80	6.0	0.6	13.0	-	-
	PEACE RIVER TRANSMISSION COMPANY LIMITED POUCE COUPE SOUTH	1/10/76	6.9	0.98	14.7	12.5	20.2
B 68-1	PATRICK T. BUCKLEY VANALTA No. 4	31/5/73	1.0 MMCF PER MONTH	0.005	-	0.06	-
TC 70-10	TRANS-CANADA PIPE LINES LIMITED ALDERSON, ALIX, AMISK, ARMADA, ATLEE-BUFFALO, BANTRY, BASHAW, BASSANO, BELLIS, BERRY, BIG BEND, BINDLOSS, BIRCH, BLACK DIAMOND, BLUERIDGE, BOYLE, BRAZEAU RIVER, BRUCE, BURN TIMBER, CAROLINE (VIKING A, VIKING E, AND BASAL MANNVILLE A POOLS), CARSTAIRS, CASSILS, CASTOR, CESSFORD, CHESTERMERE, CHIGWELL, CLIVE, CONNORSVILLE, COUNTRESS, CRAIGEND, CROSSFIELD, CROSSFIELD EAST, DRUMHELLER, EDSON, ELMORA, ENCHANT, EQUITY, ERSKINE, FENN WEST, FERRIER, FIGURE LAKE, FLAT,	31/10/94	3,118.0	1,002.0	22,360.0	4,544.4	17,815.6

TABLE C-2 (CONTINUED)

PERMIT COMMITMENTS

(ALL VOLUMES AT 14.65 PSIA AND 60°F)

PERMIT NUMBER	PERMITTEE AND FIELDS UNDER PERMIT	TERMINAL DATE OF PERMIT	PERMITTED WITHDRAWALS		WITHDRAWN TO JUNE 30, 1971 Bcf	REMAINING AUTHORIZED WITHDRAWAL Bcf
			MMcf	MAXIMUM DAY Bcf		
WC 52-1	WESTCOAST TRANSMISSION COMPANY LIMITED AND WESTCOAST TRANSMISSION COMPANY (ALBERTA) LTD. BRAEBURN, GORDONDALE, POLICE COUPE AND POUCE COUPE SOUTH.	31/12/79	125.0	35.0	388.0	128.8
WC 61-4	WESTCOAST TRANSMISSION COMPANY LIMITED AND WESTCOAST TRANSMISSION COMPANY (ALBERTA) LTD. BOUNDARY LAKE SOUTH	31/12/79	162.2	53.1	1,081.2	653.2
WC 59-3	WESTCOAST TRANSMISSION COMPANY LIMITED CROSSFIELD (CALGARY BASAL QUARTZ, CALGARY RUNDLE AND CALGARY WABAMUN POOLS), IRRICANA, AND SAVANNA CREEK.	2/12/81	59.3	16.0	220.0	124.5
WC 62-5	WESTCOAST TRANSMISSION COMPANY LIMITED AND WESTCOAST TRANSMISSION COMPANY (ALBERTA) LTD. WORSLEY	31/12/81	5,694.075	1,824.0183	39,272.090	31,367.0

APPENDIX D

THE MEETING OF ALBERTA'S REQUIREMENTS FOR GAS
AND THE PRESENT PERMIT COMMITMENTS, AND
THE RESULTING SURPLUS

The purpose of this Appendix is to assess the meeting of Alberta's requirements and the present permit commitments and the resulting surplus at June 30, 1971, prior to any consideration of the volumes applied for in the current applications of Dome and Amoco and of TransCanada.

(1) Views of TransCanada

TransCanada did not present detailed evidence to show how Alberta's 30-year requirements for gas might be met but did estimate the surplus of gas in the Province by updating the Board's estimate of contractable reserves and total Alberta requirements. With respect to the total Alberta requirements, the applicant used the Board's estimate as shown in OGCB Report 71-B⁽¹⁾ and adjusted it to reflect the 30-year period July 1, 1971 to June 30, 2001. In determining the Alberta reserves, TransCanada employed the Board's estimates shown in OGCB 71-18⁽²⁾ and adjusted those reserves where its estimate differed appreciably from the Board's estimate. The applicant submitted that it had reviewed the

(1) Report and Decision Regarding Alberta's Future Requirements for Gas. February 1971.

(2) Reserves of Crude Oil, Gas, Natural Gas Liquids and Sulphur. Province of Alberta. December 31, 1970.

development activity and discovery information available to it for fields and areas where it has not contracted for gas, and estimated that there has been an increase of at least 0.4 Tcf during the first six months of 1971.

In determining deferred reserves, TransCanada used the Board's estimate as shown in OGCB Report 71-A⁽³⁾ and adjusted it by removing from the deferred reserves category the reserves for the Harmattan East Rundle, Harmattan-Elkton Rundle C, Ricinus Cardium A and Westeros D-3 Pools. TransCanada determined the established available reserve for Harmattan East Rundle to be 728 Bcf of which, it stated at the hearing, about 580 Bcf would be considered as deferred reserves. With respect to the Harmattan-Elkton Rundle C Pool, TransCanada stated that, based on earlier commencement of blowdown and a higher gas sales rate than that estimated by the Board in Decision 71-12⁽⁴⁾, it estimated that the entire reserves for the pool would be produced within the term of the permit. The applicant submitted that studies conducted by an operator in the Ricinus Cardium A Pool indicated that optimum production from this pool will occur under a scheme of concurrent production of oil and its associated gas cap. It estimated that with gas

(3) In the Matter of an Application of Alberta and Southern Gas Co. Ltd. and In the Matter of an Application of Consolidated Natural Gas Limited Both under The Gas Resources Preservation Act, 1956. January 1971.

(4) Decision 71-12, Application No. 5396, Concurrent Production of Oil Zone and Gas Cap With Gas Cap Cycling and Partial Water Flooding of Oil Zone - Harmattan-Elkton Rundle C Pool. June 25, 1971.

sales of 40 to 50 MMcfd the majority of the gas reserves would be produced within the term of the permit. TransCanada, employing a maximum gas production rate of 15 MMcfd for the Westeros D-3 Pool under a scheme of concurrent production of oil and gas, estimated that the gas reserves for this pool would essentially be produced within the term of the permit.

TransCanada estimated that its permit related fuel and shrinkage requirements would increase by 100 Bcf as a result of the increased volume applied for. It explained that it determined the total requirement for Alberta uses associated with its permit and then deducted some 405 Bcf of gas related to reserves under contract to Consolidated and available to TransCanada under a purchase agreement to arrive at a net fuel and shrinkage requirement from reserves under contract to TransCanada.

TransCanada submitted that there are significant differences between its estimates of the heating values of the gas in some 50 fields in Permit No. TC 70-10 and those reported by the Board in OGCB 71-18. It said that the net effect of using its heating values would be to increase the gas reserves reported by the Board by more than one per cent.

TransCanada stated that it has reasonable assurance that gas from the Killam, Malmo, Newell, New Norway and Trochu Fields will be available to it and requested that these fields

continue to be named in the permit. It further requested that the Amisk, Cassils, Hughenden, Pelican, Willesden Green and Winnifred Fields be deleted from the permit because firm gas purchase contracts have not been made to remove the gas.

TransCanada submitted a table included here as Table D-4, whereby it showed that at June 30, 1971, the contractable reserves exceeded the contractable requirements by 3.6 Tcf and that a future surplus of some 3.5 Tcf existed. The overall surplus was estimated to be 7.1 Tcf of 1,000 Btu gas. TransCanada thus contended that the 2.14 Tcf of gas for which it sought authorization for removal from the Province was surplus to the needs of the Province.

(2) Views of Interveners

None of the interveners at the hearing submitted evidence respecting the meeting of Alberta's 30-year requirements for gas and the permit commitments.

(3) Views of the Board

The Meeting of Alberta's Long Term Requirements. (July 1, 1971 to June 30, 2001). As shown in Appendix C, the 30-year gas requirements for delivery to markets within the Province have been estimated by the Board to be some 16.6 Tcf. This and subsequent gas volumes mentioned in this Appendix are expressed on a 1,000 Btu per cubic foot basis unless otherwise indicated. Of this total, some 2.0 Tcf are required for fuel and shrinkage associated with permits for removal of gas from the Province; hence the estimated Alberta non-permit related

requirements are some 14.6 Tcf. The non-permit peak day requirement in the 30th year is estimated to be some 3.6 Bcf. The contractable Alberta requirements are taken as the permit related Alberta requirements plus the greater of

- (a) the remaining reserves of those fields connected to and supplying Alberta requirements, or
- (b) 30 times the non-permit related Alberta requirements of the first year of the permit under consideration.

The first quantity currently consists of the reserves of pools shown in Table D-1 which total 6.2 Tcf and the second quantity is currently 7.7 Tcf. The contractable Alberta requirements are therefore 9.7 Tcf ($7.7 + 2.0 = 9.7$).

The Board has assumed that the average reserve-delivery ratio for all reserves in the Province of 1.9 Bcf per MMcfd as determined in OGCB Report 71-A would remain applicable having regard for the changes in reserves of pools, additional deliverability data and new discoveries. The reserve-delivery ratio is defined as the initial gas in place adjusted for surface losses divided by the initial fully developed marketable gas deliverability.

The Board estimates from previous reviews of deliverability schedules that 6.9 Tcf of the 7.7 Tcf required for contractable Alberta requirements, will be produced during the 30-year period. The remaining unproduced portion will be capable of

sustaining a peak day delivery of some 300 MMcf in the 30th year. Therefore, total deliveries of about 7.7 Tcf ($14.6 - 6.9 = 7.7$) and a 30th year peak day delivery of about 3,300 MMcf ($3,600 - 300 = 3,300$) will be required from other sources.

The actual quantities of gas necessary to provide these deliveries may be calculated using the formula method presented in Appendix E of OGCB Report 64-11⁽⁵⁾. With respect to the factors to be used in the formula, the Board believes that since this gas must come in part from established gas reserves not now connected to local utilities nor authorized for removal from the Province and in part from gas reserves not yet developed, the factors should reflect the delivery characteristics of both of these sources of gas. The Board believes that the previously discussed reserve-delivery ratio of 1.9 Bcf per MMcfd should be used. The Board has also reviewed the average recovery factor of gas in place adjusted for surface losses and finds the factor of 0.74 as used in OGCB Report 71-A to be appropriate.

The following is a detailed calculation of the gas reserves in Bcf necessary to meet Alberta's 30-year general requirements:

(5) In the Matter of an Application of Trans-Canada Pipe Lines Limited and Alberta and Southern Gas Co. Ltd. under The Gas Resources Preservation Act, 1956. November 1964.

From now connected sources and additional sources needed to supply the contractable requirements for delivery during the period	6,900	
From additional sources for delivery during the period	7,700	
Total Alberta Requirements for delivery		14,600
From now connected sources and additional sources needed to supply the contractable requirements, to protect the 30th-year peak (1)	800	
From additional sources to protect the 30th-year peak (2)	4,000	
Total Alberta Requirements for peak day protection	4,800	
Total Alberta Requirements	19,400	

(1) ie. $7,700 - 6,900 = 800$

(2) Determined as

$$\begin{aligned}
 R_p &= 1.3 FP_n - (1-K) [1.3 FP_n + A_1 S] \\
 &= 1.3 (1.9)(3,300) - (1.0 - 0.74) [1.3 (1.9)(3,300) + 7,700] \\
 &= 8,151 - 4,121 = 4,030; \text{ say } 4,000 \text{ Bcf}
 \end{aligned}$$

The Remaining Permit Commitments. The permit commitments remaining at June 30, 1971 are shown in Appendix C to be some 31.4 Tcf before adjustments for heating value, for deficiencies in reserves in certain permits and for provisions for Trunk Line and reprocessing plant fuel and shrinkage.

The fields included in each of the permits are shown in Table D-2. The table shows the Board's current estimate of

the remaining reserves of marketable gas and reflects changes in the remaining marketable reserves which have occurred since the preparation of OGCB Report 71-A.

In Tables D-1 and D-2 the remaining reserves of fields which are divided between permittees and provincial requirements are shared on the basis of the Board's knowledge of the gas purchase contracts involved and in accordance with the policy set out in Board Report OGCB 69-D⁽⁶⁾. In areas where a considerable portion of the reserves are not yet under contract and the competition for reserves is high, only those reserves actually under contract have been included in the table. In areas where most of the reserves are under contract or where competition is not as great, the total reserves have been included.

The Board notes that TransCanada has not completed the necessary arrangements to take gas from the Killam, Malmo, Newell, New Norway and Trochu Fields. In view of TransCanada's contention that it is reasonably assured that the gas from these fields will become available to it, the Board believes that the above six fields should continue to be named in the permit but that the permit require that TransCanada satisfy the Board by February 1, 1973 that the necessary arrangements have been made to remove the gas.

TransCanada submitted that reserves in certain fields previously considered deferred but now under contract to TransCanada should be categorized as non-deferred for at least

(6) Report and Decision on Review of Policies and Procedures for Considering Applications under The Gas Resources Preservation Act, 1956. October 1969.

the purpose of meeting TransCanada's fuel and shrinkage. As discussed in Section IV, the Board accepts TransCanada's argument in part and will consider a judgment portion of the deferred reserves under contract to a permittee as available to satisfy the permit related fuel and shrinkage. The Board believes that the deferred reserves in the Harmattan East Rundle Pool, the Ricinus Cardium A Pool and certain other small pools can be partially relied upon to meet fuel and shrinkage requirements. In this particular instance the Board estimates that some 1,200 Bcf of the deferred reserves are under contract to TransCanada and is prepared to recognize one-half or some 600 Bcf as available to satisfy TransCanada's fuel and shrinkage.

The Board has reviewed the heating values of the gas in the fields listed in permits and has updated its values accordingly.

The results of the Board's analysis with respect to the meeting of the remaining permit commitments and the related Trunk Line and reprocessing plant fuel and shrinkage from reserves in permit fields at June 30, 1971 are shown in Table D-3. Column 1 shows the remaining permit commitment authorized in each of the permits. These figures were obtained from Appendix C and have been converted to the basis of 1,000 Btu per cubic foot using the expected average heating value of the gas as it leaves the Province. Column 2 shows the Board's current estimate of the total remaining marketable

reserves (from Table D-2) of the fields included in each permit. Column 3 shows the marketable gas required to meet the peak day commitment for Permit No. WC 59-3. Columns 4, 5 and 6 show the fuel and shrinkage requirements for each permit. Column 4 shows the fuel and shrinkage related to each permit, column 5 shows the amount of gas which is available to meet these requirements from fields not included in the permits, from deferred reserves or from other permittees. Column 6 shows the net requirements from fields named in the permits. It should be noted that TransCanada has a contract with Consolidated that will make reserves available to TransCanada to satisfy fuel and shrinkage requirements. The total is not to exceed about 400 Bcf. Table D-3 shows that Consolidated has under contract some 192 Bcf of gas beyond that necessary for its own permit and related fuel and shrinkage. The Board has accordingly considered this gas as being available to TransCanada and has shown it as an entry in column 7. Column 8 is column 2 less columns 3, 6 and 7 and presents the Board's estimate of reserves available to meet the permit commitments. Column 9 shows the remaining surplus in permit fields after the permit commitments have been met.

Except as indicated in column 5, the Board has assumed that the fuel and shrinkage would come from fields currently in the permits. The result is that certain permittees, in particular TransCanada and Westcoast Transmission Company

Limited (Northern Alberta System) do not appear to have sufficient reserves available to meet both the remaining permit commitments and the associated Trunk Line and reprocessing plant fuel and shrinkage. It should be noted that Table D-3 shows the permit situation prior to consideration of the TransCanada application and also does not include in its remaining reserves those fields applied for in the current application.

Table D-3 shows that total marketable gas reserves of some 33.5 Tcf are available in permit fields to meet the commitments of all subsisting permits of some 31.8 Tcf. The 33.5 Tcf is after providing some 0.1 Tcf for cushion gas and some 2.0 Tcf for related fuel and shrinkage. The table shows that in total a surplus of 1.7 Tcf exists in the fields named in the permits. As mentioned earlier, certain individual permits show a deficiency.

The Gas Surplus to Alberta's Requirements and the Permit Commitments. The surplus calculation using the method adopted by the Board and discussed in detail in OGCB 69-D is illustrated in Table D-5.

The table shows that the Board's estimate of contractable reserves, i.e. the reserves within economic reach (47.5 Tcf) less the deferred reserves other than those which the Board is prepared to see used by TransCanada as fuel and shrinkage (3.4 Tcf), is some 44.1 Tcf.

The deferred reserves are listed in Table D-6. The Board expects that initial production from virtually all of these reserves will take place within 30 years. The Board has considered, in the calculation of deferred reserves, the southern part of the Harmattan East Rundle Pool and the Ricinus Cardium A Pool as being deferred. For the Westeros D-3 Pool the Board believes TransCanada's estimate of the average production rate from the pool to be unrealistically high when considering the previously submitted evidence by the pool operator regarding the initial facilities to be constructed to process the gas. Based on an average production rate of 5 MMcfd the Board calculates a deferred reserves of some 44 Bcf for the Westeros D-3 Pool.

The Board notes that the northern part of a Peace River Oil Pipe Line Co. Ltd. line has been purchased by The Alberta Gas Trunk Line Company Limited and is being converted to a gas transmission line to service the Rainbow-Zama area. While the Board has not studied in detail the impact of this line on the gathering of gas in the area, it does believe that some 1.6 Tcf of gas in the area should now be changed from beyond economic reach to within economic reach. This matter is discussed in Appendix A. Notwithstanding the availability of the main transmission line into the area, there are many uncertainties as to when gas reserves from the area might be marketed. These include questions respecting the manner in which the gathering system might be completed and operated, the

economics of gathering and processing oil field solution gas, and most importantly the need for gas for oil recovery enhancement. Having regard for these matters the Board believes that most of the reserves in the area should be classified as deferred; however, it estimates that deliveries could begin from some 400 Bcf of reserves within the next year or so and thus these reserves could be classified as non-deferred. The Board will update its assessment of the Rainbow-Zama area in the coming months as answers to some of the earlier cited questions become available.

Table D-5 shows the non-permit related contractable Alberta requirements to be 7.7 Tcf, and the permit related requirements to be 2.0 Tcf, giving a total Alberta contractable requirement of 9.7 Tcf. The permit requirements are some 31.8 Tcf. The comparison of the contractable reserves and the contractable requirements results in a contractable surplus of 2.5 Tcf. It should be noted that the permit requirements do not include the volumes of ethane which the Board has recently indicated that it is prepared to approve for removal from the Province by Dome and Amoco.

The table shows that the remaining Alberta requirements total some 11.7 Tcf. These are made up of some 7.7 Tcf which the Board believes will have to be delivered during the 30-year period and some 4.0 Tcf which the Board estimates will be necessary to provide for the 30th-year peak day.

The remaining and future reserves available to meet these Alberta requirements are shown to total some 13.8 Tcf. These are made up of 3.4 Tcf of deferred gas which the Board believes will be available within the 30-year period, some 0.7 Tcf of reserves now considered beyond economic reach but which the Board believes will be within economic reach within 30 years, some 0.1 Tcf allocated to protect peak day requirements in Permit No. WC 59-3 but available within 30 years, and 9.6 Tcf of future reserves. The Board studies indicate that all 13.8 Tcf of remaining and future reserves will be available to meet deliveries or to meet the 30th-year peak day requirements.

Table D-5 shows that the total remaining reserves exceed the total remaining requirements by 2.1 Tcf.

TABLE D-1

RESERVES OF FIELDS SUPPLYING ALBERTA'S REQUIREMENTS FOR GAS

(ALL VOLUMES AT 1000 BTU PER CUBIC FOOT)

FIELD	REMAINING MARKETABLE GAS AT JUNE 30, 1971 Bcf
<u>NON-SOLUTION GAS</u>	
ACHESON	1.
ACHESON EAST	
ALDERSON	15
ALEXANDER	5
ASHMONT	7
ATHABASCA	6
ATHABASCA EAST	15
ATIM	-
BANTRY	27
BEAVER CROSSING	1
BEAVERHILL LAKE - FORT SASKATCHEWAN	315
BITTERN LAKE	97
BONNIE GLEN	6
BONNYVILLE	1
BOW ISLAND	26
BROOKS	3
CALAIS	10
CALLING LAKE	8
CAMPBELL-NAMAO	13
CARBOA	76
CASTOR	3
CHARLOTTE LAKE	1
COLD LAKE	11
CRAIG LAKE	1
DOWLING LAKE	-
DUVERNAY	1
EDWARD	4
ELK POINT	1
ELLERSLIE	-
ETHEL LAKE	1

TABLE D-1 (CONTINUED)

FIELD	REMAINING MARKETABLE GAS AT JUNE 30, 1971 Bcf
ETZIKOM	11
EXCELSIOR	37
FAIRYDELL-BON ACCORD	62
FENN-BIG VALLEY	1
FLAT	34
FOREMOST	16
FORESTBURG	2
FORT KENT	2
GLEN PARK	5
HAIRY HILL	16
HAMELIN CREEK	6
HANNA	1
HEART RIVER	1
HERCULES	21
HOLMBERG	13
JOFFRE	32
JUMPING POUND	327
JUMPING POUND WEST	793
KILLAM NORTH	17
KNELLER	5
KNOPCIK	11
LAG LA BICHE	7
LEAHURST	13
LEGAL	2
LINDBERG	7
LLOYDMINSTER	3
MEDICINE HAT	396
MELLOWDALE	1
MORINVILLE	50
MURIEL LAKE	4
NORMANDVILLE	36
OBERLIN	-
OKOTOKS	119

TABLE D-1 (CONTINUED)

FIELD	REMAINING MARKETABLE GAS AT JUNE 30, 1971 Bcf
PADDLE RIVER	111
PEMBINA	64
PROVOST	8
REDLAND	25
REDWATER	19
RYCROFT	4
SADDLE HILLS	52
ST. ALBERT-BIG LAKE	38
ST. PAUL	-
SAMSON	2
SARCEE	87
SEXSMITH	4
STETTLER	2
STETTLER NORTH	3
STIRLING	10
STRATHMORE	14
STROME	7
STURGEON LAKE SOUTH	30
THORHILD	11
TURNER VALLEY	114
TWEEDIE	61
VIKING KINSELLA	359
WAINWRIGHT	17
WATTS	3
WAYNE-ROSEDALE	48
WESTLOCK	250
WHITELAW	36
WILDMERE	15
WILLINGDON	29
WINNIFRED	5
WIZARD LAKE	6
WOKING	21
SUBTOTAL	4,185

TABLE D-1 (CONTINUED)

FIELD	REMAINING MARKETABLE GAS AT JUNE 30, 1971 Bcf
<u>SOLUTION GAS</u>	
ACHESON	16
ACHESON EAST	2
BONNIE GLEN	256
FENN-BIG VALLEY	7
GLEN PARK	9
JUDY CREEK	166
LEDUC-WOODBEND	50
PEMBINA	784
REDWATER	39
SAMSON	2
SIMONETTE	26
STETTLER	2
STURGEON LAKE SOUTH	5
SWAN HILLS	243
SWAN HILLS SOUTH	126
TURNER VALLEY	64
VIRGINIA HILLS	35
WIZARD LAKE	160
SUBTOTAL	1,993
TOTAL RESERVES CONNECTED AND SUPPLYING REQUIREMENTS	6,178

TABLE D-2

MARKETABLE RESERVES AVAILABLE IN THE FIELDS INCLUDED IN PERMITS

(ALL VOLUMES AT 1000 BTU PER CUBIC FOOT)

FIELD	REMAINING MARKETABLE GAS AT JUNE 30, 1971 Bcf
<u>ALBERTA AND SOUTHERN GAS CO., LTD.</u> (PERMIT NO. AS 71-6)	
BELLOY	75
BERLAND RIVER	323
BIGORAY	59
BIGSTONE	294
BRAZEAU RIVER	446
CAROLINE	47
CARSON CREEK	231
CARSON CREEK NORTH	187
CROSSFIELD	801
DUNVEGAN	982
EAGLESHAM	62
FERRIER	15
FOX CREEK	110
GILBY	25
GOLD CREEK	246
HARMATTAN-ELKTON	295
HOMEGLEN-RIMBEY	126
HUNTER VALLEY	29
JUDY CREEK	106
KAYBOB	437
KAYBOB SOUTH	1,475
MARLBORO	100
MEDICINE RIVER	9
MINNEHIK-BUCK LAKE	500
OPEN CREEK	40
PEMBINA	127
PINE CREEK	199
PINE NORTH-WEST	153
QUIRK CREEK	21

TABLE D-2 (CONTINUED)

FIELD	REMAINING MARKETABLE GAS AT JUNE 30, 1971 Bcf
RICINUS	61
RICINUS WEST	152
SIMONETTE	113
STURGEON LAKE SOUTH	63
SUNDRE	5
SWAN HILLS	88
SWAN HILLS SOUTH	45
SYLVAN LAKE	11
TANGENT	63
VIRGINIA HILLS	59
WASKAHIGAN	101
WATERTON	1,924
WESTEROSE SOUTH	387
WESTWARD HO	-
WILDCAT HILLS	513
WILDHORSE CREEK	54
WILLESDEN GREEN	176
WILSON CREEK	54
WINDFALL	446
TOTAL	11,835

CANADIAN-MONTANA PIPELINE COMPANY (PERMIT No. CM 54-1 AND CM 61-2)

ADEN	25
BLACK BUTTE	29
COMREY	23
KNAPPEN	14
LAIT	6
MANYBERRIES	8
PAKOWKI LAKE	11
PENDANT D'OUREILLE	146
SMITH COULEE	9
TOTAL	271

TABLE D-2 (CONTINUED)

FIELD	REMAINING MARKETABLE GAS AT JUNE 30, 1971 Bcf
<u>CONSOLIDATED NATURAL GAS LIMITED (PERMIT No. CNG 69-1)</u>	
CRAIGEND	48
DONALDA	39
GALAHAD	4
HALKIRK	3
KAYBOB SOUTH	1,237
LEAHURST	1
MATZIWIN	10
MIKWAN	13
RED WILLOW	32
RICINUS	39
RICINUS WEST	706
STRACHAN	812
TOTAL	2,944
<u>TRANS-CANADA PIPE LINES LIMITED (PERMIT No. TC 70-10)</u>	
ALDERSON	487
ALIX	2
AMISK	9
ARMADA	9
ATLEE-BUFFALO	94
BANTRY	55
BASHAW	20
BASSANO	22
BELLIS	64
BERRY	7
BIG BEND	105
BINDLOSS	195
BIRCH	15
BLACK DIAMOND	19
BLUERIDGE	35
BOYLE	8
BRAZEAU RIVER	555
BRUCE	45
BURNT TIMBER	285

TABLE D-2 (CONTINUED)

FIELD	REMAINING MARKETABLE GAS AT JUNE 30, 1971 Bcf
CAROLINE	120
CARSTAIRS	553
CASSILS	9
CASTOR	32
CESSFORD	459
CHESTERMERE	36
CHIGWELL	26
CLIVE	13
CONNORSVILLE	54
COUNTESS	144
CRAIGEND	180
CROSSFIELD	276
CROSSFIELD EAST	535
DRUMHELLER	62
EDSON	1,805
ELNORA	34
ENCHANT	37
EQUITY	40
ERSKINE	47
FENN WEST	8
FERRIER	507
FIGURE LAKE	29
FLAT	88
GARRINGTON	31
GHOST PINE	373
GILBY	663
GOODWIN	11
GREENCOURT	150
HACKETT	9
HALLIDAY	3
HARMATTAN EAST	135
HARMATTAN-ELKTON	3
HIGHLAND	10
HOMEGLEN-RIMBEY	324
HUGHENDON	5

TABLE D-2 (CONTINUED)

FIELD	REMAINING MARKETABLE GAS AT JUNE 30, 1971 Scf
HUNTER VALLEY	19
HUSSAR	247
INNISFAIL	96
JARROW	11
JENNER	42
JOHNSON	1
JUMPING POUND WEST	377
KELLAM	27
KIRKWALL	2
KITSIM	5
LATHOM	5
LECKIE	-
LITTLE BOW	23
LONE PINE CREEK	403
LONG COULEE	13
LOOKOUT BUTTE	199
MALMO	42
MARTEN HILLS	825
McMULLEN	7
MEDICINE HAT	351
MEDICINE RIVER	251
MIKWAN	13
MITSUE	213
MOOSE	55
NEVIS	581
NEWELL	1
NEW NORWAY	11
NIPISI	83
OBED	186
OLDS	249
OYEN	49
PARFLESH	8
PELICAN	12
PINCHER CREEK	111

TABLE D-2 (CONTINUED)

FIELD	REMAINING MARKETABLE GAS AT JUNE 30, 1971 Bcf
PLAIN	62
PREVO	31
PRINCESS	95
PROVOST	635
QUIRK CREEK	306
RAINIER	1
RANFURLY	8
RETLAW	86
RICH	11
RICHDALE	36
RICINUS	39
RICINUS WEST	152
ROWLEY	53
SCANDIA	13
SEDALIA	49
SEGEWICK	24
SEIU LAKE	10
SIBBALD	25
STANDARD	19
STANMORE	74
STRACHAN	1,065
SUNDRE	15
SUNNYSOOK	13
SUPERBA	-
SWALWELL	44
SYLVAN LAKE	351
THREE HILLS CREEK	63
TROCHU	16
TURIN	23
TWINING NORTH	42
UKALTA	31
VERGER	56
VULCAN	22
WARWICK	35
WAYNE-ROSEDALE	213

TABLE D-2 (CONTINUED)

FIELD	REMAINING MARKETABLE GAS AT JUNE 30, 1971 Bcf
WESTEROSE	137
WESTEROSE SOUTH	480
WHISKEY	111
WHITECOURT	109
WILDHORSE CREEK	54
WILDUNN CREEK	17
WILLESSEN GREEN	7
WIMBORNE	177
WINNIFRED	15
WINTERING HILLS	49
WOOD RIVER	12
TOTAL	18,247
<u>WESTCOAST TRANSMISSION COMPANY LIMITED (PERMIT No. WC 59-3)</u>	
CROSSFIELD	658
IRRICANA	9
SAVANNA CREEK	72
TOTAL	739
<u>WESTCOAST TRANSMISSION COMPANY LIMITED AND WESTCOAST TRANSMISSION COMPANY (ALBERTA) LTD. (PERMIT No. WC 52-1 AND WC 62-5)</u>	
BRAEBURN	-
GORDONDALE	12
POUCE COUPE	35
POUCE COUPE SOUTH	27
WORSLEY	35
TOTAL	109
<u>WESTCOAST TRANSMISSION COMPANY LIMITED AND WESTCOAST TRANSMISSION COMPANY (ALBERTA) LTD. (PERMIT No. WC 61-4)</u>	
BOUNDARY LAKE SOUTH	74
<u>OTHERS</u>	
ANTELOPE	13
BOUNDARY LAKE SOUTH	-
ESTHER	31

TABLE D-2 (CONTINUED)

FIELD	REMAINING MARKETABLE GAS AT JUNE 30, 1971 Bcf
HUDSON	4
MEDICINE HAT	530
RED COULEE	2
TOTAL	580
TOTAL (ALL FIELDS)	34,799

RESERVES AVAILABLE TO MEET PRESENT PERMIT COMMITMENTS⁽¹⁾
(ALL VOLUMES AT 1000 BTU PER CUBIC FOOT)

D-39

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	
			TRUNK LINE AND REPROCESSING REQUIREMENTS						
	REMAINING PERMIT COMMITMENT(2) BcF	REMAINING RESERVES IN PERMIT FIELDS BcF	GAS REQUIRED TO MEET TERMINAL YEAR PEAK DAY BcF	FUEL AND SHRINKAGE BcF	AVAILABLE FROM NON-PERMIT AND DEFERRED RESERVES BcF	NET REQUIREMENTS BcF	AVAILABLE TO OTHER PERMITTEES BcF	TOTAL RESERVES AVAILABLE TO MEET REMAINING PERMIT COMMITMENTS BcF	REMAINING SURPLUS BcF
ALBERTA AND SOUTHERN GAS CO. LTD.	9,463	11,835	-	592	154(3)	438	-	11,397	1,934
CANADIAN MONTANA PIPE LINE COMPANY	271	271	-	-	-	-	-	271	-
CONSOLIDATED NATURAL GAS LIMITED	2,559	2,944	-	193	-	193	192(6)	2,559	-
TRANS-CANADA PIPE LINES LIMITED (4)	18,012	18,247	-	1,185	792(5)	393	-	17,854	-158
WESTCOAST TRANSMISSION COMPANY LIMITED (SOUTHERN ALBERTA) (4)	662	739	65	12	-	12	-	662	-
WESTCOAST TRANSMISSION COMPANY LIMITED (NORTHERN ALBERTA)	258	183	-	4	-	4	-	179	-79
OTHERS	560	580	-	9	-	9	-	571	11
TOTALS	31,785	34,799	65	1,995	946	1,049	192	33,493	1,703
ROUNDED TOTALS	31,800	34,800	100	2,000	900	1,000	200	33,500	1,700

(1) ALL FIGURES ARE AS OF JUNE 30, 1971, BUT THE DOME-ANOCO ETHANE VOLUMES ARE EXCLUDED.

(2) ON THE BASIS OF THE HEATING VALUE OF THE GAS AS IT LEAVES THE PROVINCE.

(3) BASED ON ASSUMPTION THAT ONLY ALBERTA AND SOUTHERN HAVE ENTERED INTO CONTRACTS FOR SUCH GAS.

(4) TRANS-CANADA DELIVERIES FROM CERTAIN CROSSFIELD POOLS ARE DEPENDENT ON DELIVERABILITY SURPLUS TO THAT REQUIRED BY WESTCOAST IN THE SAME POOLS.

(5) 192 BcF AVAILABLE FROM CONSOLIDATED AND 600 BcF AVAILABLE FROM DEFERRED RESERVES.

(6) AVAILABLE TO TRANSCANADA TO MEET FUEL AND SHRINKAGE REQUIREMENTS.

TABLE D-4

GAS SURPLUS TO ALBERTA'S REQUIREMENTS AND PERMIT COMMITMENTS
 AS ESTIMATED BY TRANSCANADA
 AS OF JUNE 30, 1971
 (ALL VOLUMES IN TRILLIONS OF CUBIC FEET AT 1000 BTU PER CUBIC FOOT)

CONTRACTABLE RESERVES

NOW CONSIDERED WITHIN ECONOMIC REACH	47.6	
LESS: DEFERRED	2.5	
TOTAL CONTRACTABLE RESERVES		45.1

CONTRACTABLE REQUIREMENTS

CONTRACTABLE ALBERTA REQUIREMENTS:		
GENERAL REQUIREMENTS	7.5	
PERMIT-RELATED FUEL AND SHRINKAGE	2.3	
PERMIT REQUIREMENTS: TO MEET REMAINING COMMITMENTS	31.6	
TO MEET TERMINAL YEAR PEAK DAY	0.1	
TOTAL CONTRACTABLE REQUIREMENTS		41.7
	CONTRACTABLE SURPLUS	3.6

REMAINING REQUIREMENTS

TOTAL ALBERTA REQUIREMENTS FOR DELIVERY	14.2	
TOTAL ALBERTA REQUIREMENTS FOR 30TH-YEAR PEAK DAY	3.9	
TOTAL ALBERTA REQUIREMENTS	18.1	
LESS: AVAILABLE FROM CONTRACTABLE RESERVES	6.5	
TOTAL REMAINING REQUIREMENTS		11.6

REMAINING AND FUTURE RESERVES

FROM DEFERRED GAS AVAILABLE WITHIN 30 YEARS	2.5	
FROM RESERVES NOW CONSIDERED BEYOND ECONOMIC REACH	1.7	
FROM RESERVES PROVIDING FOR TERMINAL YEARS PEAK DAY IN PERMITS	0.1	
FROM GAS NOT YET ESTABLISHED	10.8	
TOTAL REMAINING AND FUTURE RESERVES		15.1
	FUTURE SURPLUS	3.5
	OVERALL SURPLUS	7.1

TABLE D-5

GAS SURPLUS TO ALBERTA'S REQUIREMENTS AND PERMIT COMMITMENTS

AS ESTIMATED BY THE BOARD

AS OF JUNE 30, 1971

(ALL VOLUMES IN TRILLIONS OF CUBIC FEET AT 1000 BTU PER CUBIC FOOT)

CONTRACTABLE RESERVES

NOW CONSIDERED WITHIN ECONOMIC REACH	47.5	
LESS: DEFERRED	3.4	
TOTAL CONTRACTABLE RESERVES		44.1

CONTRACTABLE REQUIREMENTS

CONTRACTABLE ALBERTA REQUIREMENTS:		
GENERAL REQUIREMENTS	7.7	
PERMIT-RELATED FUEL AND SHRINKAGE	2.0	
PERMIT REQUIREMENTS: TO MEET REMAINING COMMITMENTS	31.8	
TO MEET TERMINAL YEAR PEAK DAY	0.1	
TOTAL CONTRACTABLE REQUIREMENTS		41.6
	CONTRACTABLE SURPLUS	2.5

REMAINING REQUIREMENTS

TOTAL ALBERTA REQUIREMENTS FOR DELIVERY	16.6	
LESS: DELIVERIES FROM CONTRACTABLE RESERVES	6.9	
LESS: PERMIT-RELATED FUEL AND SHRINKAGE	2.0	
DELIVERIES REQUIRED FROM OTHER SOURCES	7.7	
TOTAL ALBERTA REQUIREMENTS FOR 30TH-YEAR PEAK DAY	4.8	
LESS: AVAILABLE FROM CONTRACTABLE RESERVES	0.8	
REQUIRED FROM OTHER SOURCES TO MEET 30TH-YEAR PEAK DAY	4.0	
TOTAL REMAINING REQUIREMENTS		11.7

REMAINING AND FUTURE RESERVES

FROM DEFERRED GAS AVAILABLE WITHIN 30 YEARS	3.4	
FROM RESERVES NOW CONSIDERED BEYOND ECONOMIC REACH	0.7	
FROM RESERVES PROVIDING FOR TERMINAL YEARS PEAK DAY IN PERMITS	0.1	
FROM GAS NOT YET ESTABLISHED	9.6	
TOTAL REMAINING AND FUTURE RESERVES		13.8

FUTURE SURPLUS

2.1

TABLE D-6

DEFERRED RESERVES
(ALL VOLUMES AT 1000 BTU PER CUBIC FOOT)

<u>POOL MARKETABLE WITHIN 30 YEARS</u>	<u>MARKETABLE RESERVES AT JUNE 30, 1971 Bcf</u>
BONNIE GLEN D-3 A	383
GOLDEN SPIKE D-3 A	248
HARMATTAN EAST RUNDLE	797
LEDUC-WOODBEND D-3 A	365
RAINBOW-ZAMA AREA	1,190
RICINUS CARDIUM A	220
WESTEROSE D-3	44
OTHER SMALL AND CONFIDENTIAL RESERVES	757
SUBTOTAL	4,004
LESS PORTION UNDER CONTRACT TO TRANSCANADA AND AVAILABLE FOR FUEL AND SHRINKAGE	<u>600</u>
TOTAL DEFERRED RESERVES	3,404

APPENDIX E

THE APPLICATION FOR AUTHORIZATION FOR THE REMOVAL OF
ADDITIONAL QUANTITIES OF GAS AND THE EFFECT THE
AUTHORIZATION WOULD HAVE ON SURPLUS

TransCanada is now authorized under Permit No. TC 70-10 to remove from the Province 22,360 Bcf of gas, of which some 4,544 Bcf have been removed to June 30, 1971. It applied for an increase of 2,140 Bcf in the quantity authorized under Permit No. TC 70-10, to bring the total to 24,500 Bcf of gas, at a maximum daily rate of 3,355 MMcf, from the fields now named in its permit, except for six fields which it applied to have deleted, and from five new fields and areas. The Board, in ERCB Report 71-E-OG⁽¹⁾ has approved, subject to the approval of the Lieutenant Governor in Council, the removal from the Province of certain volumes of ethane. With the extraction of the additional amounts of ethane from the gas removable under TransCanada's permit, the Board estimates the average heating value of the permit gas as it leaves the Province would be reduced to 1,000 Btu per cubic foot. All volumes subsequently referred to in this Appendix are on that basis. The volumes in the existing TransCanada permit and the requested changes are summarized below:

(1) In the Matter of an Application for a Permit Authorizing the Removal of Ethane from the Province of Dome Petroleum Limited and Amoco Canada Petroleum Company Ltd. under The Gas Resources Preservation Act. December, 1971.

	As Is and 1,000 Btu Basis
Existing permit volumes, Bcf	22,360
Additional applied for, Bcf	<u>2,140</u>
Volumes if the application is granted, Bcf	24,500
Removed to June 30, 1971, Bcf	4,544
Remaining permit volume if the application is granted, Bcf	19,956
Present maximum daily rate, MMcfd	3,118
Maximum daily rate applied for, MMcfd	3,355

The Board estimates that TransCanada's permit related requirements for Trunk Line and reprocessing plant fuel and shrinkage would increase by 127 Bcf if the application were granted.

Table E-1 shows the Board's estimates of the remaining reserves of marketable gas in the fields which TransCanada applied to have added to its permit. It also shows the reserves in certain fields to be deleted from the permit. The Board notes that TransCanada has gas contracts for part of the Edwand Field and is pursuing further contracts in the Field. In line with the discussion in Section IV of this report the Board believes it appropriate to include the Edwand Field in the permit.

Table E-2 summarizes the reserves available to supply Alberta's requirements and the various permit commitments.

E-3

Much of the data is taken from Tables D-1 and D-2 and the fields TransCanada has applied to include in its permit have been added. Since the ethane the Board is prepared to authorize for removal from the Province by Dome and Amoco would come primarily from TransCanada gas, 408 Bcf of gas has been deducted from the reserves available to TransCanada. This includes the fuel associated with the ethane to be removed from the Province. Of the total of 548 Bcf required by Dome and Amoco, some 140 Bcf of the gas would be obtained from the Bonnie Glen and Edmonton Liquid Gas plants and has been deducted from the reserves supplying Alberta's requirements as shown in Table E-2.

The Board's analysis of the reserves available to meet the various permit commitments including the additional volumes applied for by TransCanada and the related fuel and shrinkage are presented in Table E-3. The table is similar in form to the previously discussed Table D-3. One change involves the replacement of the TransCanada entry with a new entry including the additional quantities of gas applied for, the additional reserves available to the applicant from the fields TransCanada applied to have added in the permit, and the increased fuel and shrinkage requirements. It should be noted that the TransCanada permit commitment, prior to addition of the additional quantities applied for, has changed from that shown in Table D-3. The change results from the lower heating value of the gas leaving the Province following the anticipated extraction of the additional volumes of ethane at

the Dome Express Plant. The permit commitment for Consolidated also reflects a change in the heating value as a result of the proposed removal of ethane at the Dome Empress Plant. Also included in Table E-3 is an entry showing the volumes of gas the Board is prepared to place under permit to Dome and Amoco.

Table E-3 shows a remaining permit commitment to TransCanada of some 20.0 Tcf of gas. This includes the additional volumes applied for and an adjustment to the heating value of the gas to account for the removal of ethane. As indicated in Table E-2, the remaining reserves in TransCanada's permit fields after provision for the ethane for the proposed Dome and Amoco permit amounts to some 18.6 Tcf. The fuel and shrinkage volume of some 1.3 Tcf shown in Table E-3 for TransCanada reflects only those volumes associated with its permit and does not include the ethane related to the Dome and Amoco permit. Column 5 of Table E-3 shows an entry of 820 Bcf of gas available to TransCanada from Consolidated (220 Bcf) and from deferred reserves (600 Bcf) to meet fuel and shrinkage requirements as discussed in Appendix D. The result of the analysis shows that TransCanada does not have sufficient reserves available to meet the remaining permit commitments including the additional 2.14 Tcf of gas applied for. In fact, column 9 shows a deficit of some 1,835 Bcf of gas, indicating that TransCanada has under contract and

available to it only some 305 Bcf of the additional volumes applied for. If the fuel and shrinkage for TransCanada is adjusted downward to account for the volume of remaining surplus gas it has available to it, then some 410 Bcf (305 + 105) of gas would be available for addition to the volumes in TransCanada's permit. The necessity to reduce the volume of gas by which the volumes in TransCanada's permit could be increased to 410 Bcf relates to the Board's estimate of the volume of gas under contract and available to TransCanada and not the overall surplus position in the Province.

Table E-4 shows the remaining permit commitments after adjusting TransCanada's permit commitment to reflect the 410 Bcf of gas available to it.

The Board has analyzed in some detail the difference in reserves considered available to TransCanada as estimated by the Board and by TransCanada in its submission. There are two main reasons why it does not agree with the TransCanada interpretation of reserves available to it. Firstly, the Board differed significantly in the reserve estimates for certain fields named in the TransCanada permit. Secondly, as discussed in Appendix D, the Board does not believe it appropriate to remove from the deferred category all of the reserves in certain pools which TransCanada includes in its calculation of available volumes.

In light of its conclusion respecting the gas available

to TransCanada, the Board is prepared to permit, subject to approval of the Lieutenant Governor in Council, the removal from the Province by TransCanada of an additional 410 Bcf of gas. The Board is prepared to amend the permit insofar as the naming of additional fields is concerned, but is not prepared to grant the full applied for maximum daily and annual volumes which may be removed from the Province of 3.355 Bcf and 1.100 Tcf, respectively. Rather, the Board has, on the basis of the ratio of the reserves available to the increased volumes applied for, decided that new maximum volumes of 3.160 Bcf per day and 1.020 Tcf per year would be appropriate.

To provide an up to date picture of the surplus situation the Board has included Table E-5. This calculation reflects the additional volume of 410 Bcf to be removed by TransCanada and the volumes of ethane to be removed by Dome and Amoco. Table E-5 shows that a surplus of 1.8 Tcf will exist in the contractable category if the reduced application of TransCanada and the Dome-Amoco application should be approved. The table also shows that the remaining and future reserves will exceed the remaining requirements by some 2.1 Tcf.

TABLE E-1

RESERVES OF FIELDS TO BE ADDED TO OR DELETED FROM TRANSCANADA PERMIT

(ALL VOLUMES AT 1000 BTU PER CUBIC FOOT)

FIELD	REMAINING MARKETABLE GAS AT JUNE 30, 1971 Bcf
<u>FIELDS TO BE ADDED</u>	
EDWARD	2
FERRYBANK	40
HARMATTAN-ELKTON	735
HUXLEY	52
ROCKYFORD	3
TOTAL	830
<u>FIELDS TO BE DELETED</u>	
AMISK	9
CASSILS	9
HUGHENDEN	5
PELICAN	12
WILLESSEN GREEN	7
WINNIFRED	15
TOTAL	57
NET ADDITIONAL RESERVES AVAILABLE	773

TABLE E-2

SUMMARY OF AVAILABLE RESERVES
(ALL VOLUMES AT 1000 BTU PER CUBIC FOOT)

FIELD	REMAINING MARKETABLE GAS AT JUNE 30, 1971 Bcf
<u>SUPPLYING ALBERTA REQUIREMENTS</u>	
PRESENTLY CONNECTED	6,178
LESS AMOUNT AVAILABLE TO DOME FROM BONNIE GLEN AND EDMONTON LIQUID GAS PLANTS	140
TOTAL SUPPLYING ALBERTA REQUIREMENTS	6,038
<u>SUPPLYING PERMIT REQUIREMENTS</u>	
ALBERTA AND SOUTHERN	11,835
CANADIAN MONTANA	271
CONSOLIDATED	2,944
DOME	
FROM TRANSCANADA	408
FROM ALBERTA REQUIREMENTS	140
TOTAL	548
TRANSCANADA	
FROM FIELDS PRESENTLY IN PERMIT	18,247
FROM FIELDS APPLIED FOR (TABLE E-1)	773
LESS AVAILABLE TO DOME	408
TOTAL	18,612
WESTCOAST (SOUTHERN ALBERTA)	739
WESTCOAST (NORTHERN ALBERTA)	183
OTHERS	580
TOTAL SUPPLYING PERMIT REQUIREMENTS	35,713

RESERVES AVAILABLE TO MEET PRESENT PERMIT COMMITMENTS AND THE PRESENT APPLICATIONS (1)
(ALL VOLUMES AT 1000 BTU PER CUBIC FOOT)

E-11

(3) ON THE BASIS OF THE HEATING VALUE OF THE GAS AS IT LEAVES THE PROVINCE.

(3) BASED ON ASSUMPTION THAT ONLY ALBERTA AND SOUTHERN HAVE ENTERED INTO CONTRACTS FOR SUCH GAS.

(4) TRANS-CANADA DELIVERIES FROM CERTAIN PROPERTIES DO NOT EXCEED 100,000 CUBIC FEET PER MONTH.

(4) TRANS-CANADA DELIVERIES FROM CERTAIN CROSSFIELD TO THAT REQUIRED BY WESTCOAST IN THE SAME POOLS.

(5) 220 BCF AVAILABLE FROM CONSOLIDATED AND 600 BCF AVAILABLE FROM DEFERRED RESERVES.

(6) AVAILABLE TO TRANSCANADA TO MEET FUEL AND SHRINKAGE REQUIREMENTS.

TABLE E-4

RESERVES AVAILABLE TO MEET PRESENT PERMIT COMMITMENTS AND THE ADJUSTED APPLICATIONS (1)
(ALL VOLUMES AT 1000 BTU PER CUBIC FOOT)

(1) PERMITTEE	(2) REMAINING PERMIT COMMITMENT (2) Bcf	(3) GAS REQUIRED TO MEET TERMINAL YEAR PEAK DAY Bcf	(4) FUEL AND SHRINKAGE Bcf	(5) AVAILABLE FROM NON-PERMIT AND DEFERRED RESERVES Bcf	(6) NET REQUIREMENTS Bcf	(7) AVAILABLE TO OTHER PERMITTEES Bcf	(8) TOTAL RESERVES AVAILABLE TO MEET REMAINING PERMIT COMMITMENTS Bcf	(9) REMAINING SURPLUS Bcf
TRUNK LINE AND REPROCESSING REQUIREMENTS								
ALBERTA AND SOUTHERN Gas Co. Ltd.	9,463	-	592	154 (3)	438	-	11,397	1,934
CANADIAN MONTANA PIPE LINE COMPANY	271	-	-	-	-	-	271	-
CONSOLIDATED NATURAL Gas Limited	2,531	-	193	-	193	220 (6)	2,531	-
TRANS-CANADA PIPE LINES LIMITED (4)	18,226	-	1,207	820 (5)	387	-	18,226	-
DOMO PETROLEUM LTD. AND AMOCO CANADA PETROLEUM COMPANY LTD.	543	-	5	-	5	-	543	-
WESTCOAST TRANSMISSION COMPANY LIMITED (SOUTHERN ALBERTA) (4)	662	65	12	-	12	-	662	-
WESTCOAST TRANSMISSION COMPANY LIMITED (NORTHERN ALBERTA)	258	-	4	-	4	-	179	-79
OTHERS	560	-	9	-	9	-	571	11
TOTALS	32,514	65	2,022	974	1,048	220	34,380	1,866
ROUNDED TOTALS	32,500	100	2,000	1,000	1,000	200	34,400	1,900

(1) ALL FIGURES ARE AS OF JUNE 30, 1971 AND THE DOME-AMOCO ETHANE VOLUMES ARE INCLUDED.

(2) ON THE BASIS OF THE HEATING VALUE OF THE GAS AS IT LEAVES THE PROVINCE.

(3) BASED ON ASSUMPTION THAT ONLY ALBERTA AND SOUTHERN HAVE ENTERED INTO CONTRACTS FOR SUCH GAS.

(4) TRANS-CANADA DELIVERIES FROM CERTAIN CROSSFIELD POOLS ARE DEPENDENT ON DELIVERABILITY SURPLUS TO THAT REQUIRED BY WESTCOAST IN THE SAME POOLS.

(5) 220 Bcf AVAILABLE FROM CONSOLIDATED AND 600 Bcf AVAILABLE FROM DEFERRED RESERVES.

(6) AVAILABLE TO TRANSCANADA TO MEET FUEL AND SHRINKAGE REQUIREMENTS.

TABLE E-5

GAS SURPLUS TO ALBERTA'S REQUIREMENTS AND PERMIT COMMITMENTS AND THE
ADJUSTED APPLICATIONS AS ESTIMATED BY THE BOARD

AS OF JUNE 30, 1971

(ALL VOLUMES IN TRILLIONS OF CUBIC FEET AT 1000 BTU PER CUBIC FOOT)

CONTRACTABLE RESERVES

NOW CONSIDERED WITHIN ECONOMIC REACH	47.5	
LESS: DEFERRED	3.4	
TOTAL CONTRACTABLE RESERVES		44.1

CONTRACTABLE REQUIREMENTS

CONTRACTABLE ALBERTA REQUIREMENTS			
GENERAL REQUIREMENTS	7.7		
PERMIT-RELATED FUEL AND SHRINKAGE	2.0		
PERMIT REQUIREMENTS: TO MEET REMAINING COMMITMENTS	32.5		
TO MEET TERMINAL YEAR PEAK DAY	0.1		
TOTAL CONTRACTABLE REQUIREMENTS	42.3		
CONTRACTABLE SURPLUS			1.8

REMAINING REQUIREMENTS

TOTAL ALBERTA REQUIREMENTS FOR DELIVERY	16.6		
LESS: DELIVERIES FROM CONTRACTABLE RESERVES	6.9		
LESS: PERMIT-RELATED FUEL AND SHRINKAGE	2.0		
DELIVERIES REQUIRED FROM OTHER SOURCES	7.7		
TOTAL ALBERTA REQUIREMENTS FOR 30TH- YEAR PEAK DAY	4.8		
LESS: AVAILABLE FROM CONTRACTABLE RESERVES	0.8		
REQUIRED FROM OTHER SOURCES TO MEET 30TH- YEAR PEAK DAY	4.0		
TOTAL REMAINING REQUIREMENTS	11.7		

REMAINING AND FUTURE RESERVES

FROM DEFERRED GAS AVAILABLE WITHIN 30 YEARS	3.4		
FROM RESERVES NOW CONSIDERED BEYOND ECONOMIC REACH	0.7		
FROM RESERVES PROVIDING FOR TERMINAL YEARS PEAK DAY IN PERMITS	0.1		
FROM GAS NOT YET ESTABLISHED	9.6		
TOTAL REMAINING AND FUTURE RESERVES	13.8		

FUTURE SURPLUS

2.1

APPENDIX F

FORM OF PERMIT

IN THE MATTER of The Gas
Resources Preservation Act,
being chapter 157 of the
Revised Statutes of Alberta,
1970; and

IN THE MATTER of a Permit to
Trans-Canada Pipe Lines Limited
authorizing the removal of gas
from the Province

PERMIT NO. TC 71-11

WHEREAS Trans-Canada Pipe Lines Limited (hereinafter
called "the Permittee") is removing gas from the Province
under the authority of Permit No. TC 70-10; and

WHEREAS the Permittee has applied to the Energy
Resources Conservation Board for an increase in the volumes
of gas that it may remove or cause to be removed from the
Province, for other amendments and for consolidation of its
permit; and

WHEREAS the Board upon inquiry into and hearing of
the application has found that the Permittee is a person who
appears to have made arrangements to purchase gas within the
Province and who proposes to remove such gas from the Province
and that the provisions of The Gas Resources Preservation Act
affecting the application have been complied with; and

WHEREAS the Board is of the opinion that the granting
of this Permit for the removal of gas from the Province is in
the public interest having regard to the present and future
needs of persons within the Province and to the established

reserves and the trends in growth and discovery of reserves of gas in the Province; and

WHEREAS the Lieutenant Governor in Council has given his approval by an Order in Council, numbered O.C. ____/71 and dated _____, 1971.

THEREFORE, the Energy Resources Conservation Board, pursuant to the provisions of The Gas Resources Preservation Act, being chapter 157 of the Revised Statutes of Alberta, 1970, hereby grants a permit to Trans-Canada Pipe Lines Limited, and hereby authorizes the removal of gas from the Province, subject to the regulations and orders made pursuant to the provisions of the said Act and to the terms and conditions prescribed in this Permit as follows:

1. Subject to the conformity by the Permittee with the terms and conditions hereof, this Permit shall be operative for a term commencing on the date hereof and ending on October 31, 1995.

2. The quantity of gas that may be removed from the Province pursuant to this Permit shall not exceed

(a) a total quantity of 22,770,000,000,000 cubic feet less the quantity removed from the Province under permits of which Trans-Canada Pipe Lines Limited was at any time the permittee, nor

(b) during any consecutive 24-hour period or any

consecutive 12-month period ending October 31, rates limited by field productivity and good engineering practice, but in a 24-hour period such rates shall not exceed 3,160,000,000 cubic feet and in a 12-month period such rates shall not exceed 1,020,000,000,000 cubic feet.

3. The quantity of gas that may be removed from the Province in accordance with clause 2, subclause (b), during any 12-month period ending October 31, may be augmented by any part of the quantity by which gas removed from the Province under this Permit, Permit No. TC 67-7, Permit No. TC 68-8, Permit No. PG 64-1, Permit No. TC 69-9 and Permit No. TC 70-10 in the last preceding four-year period ending October 31, shall have been less than the sum of the annual volumes stipulated in clauses 2 of the permit or permits to be so removed in the four-year period and which has not, in the meantime, been removed from the Province as an augmentation authorized by this clause, but nothing herein authorizes the removal of gas from the Province in any consecutive 24-hour period or during the term of the Permit in excess of the volumes stipulated for such periods in clause 2.

4. Notwithstanding the provisions of clause 2, subclause (b), the Permittee, for the purpose only of alleviating temporary operating problems caused by pipe line or equipment failure, may remove in any consecutive 24-hour period 110 per

cent of the volume of gas authorized by said subclause (b).

5. The Permittee, subject to clause 8, may remove or cause to be removed from the Province under the authority of this Permit, only gas produced from the following pools, fields and areas:

Alderson Field	Castor Field
Alix Field	Cessford Field
Armada Field	Chestermere Field
Atlee-Buffalo Field	Chigwell Field
Bantry Field	Clive Field
Bashaw Field	Connorsville Field
Bassano Field	Countess Field
Bellis Field	Craigend Field
Berry Field	Crossfield Field
Big Bend Field	Crossfield East Field
Bindloss Field	Drumheller Field
Birch Field	Edson Field
Black Diamond Field	Edwand Field
Blueridge Field	Elnora Field
Boyle Field	Enchant Field
Brazeau River Field	Equity Field
Bruce Field	Erskine Field
Burnt Timber Field	Fenn West Field
Caroline Viking A Pool	Ferrier Field
Caroline Viking E Pool	Ferrybank Field
Caroline Basal Mannville A Pool	Figure Lake Field
Carstairs Field	Flat Field

Garrington Mannville A Pool	Lone Pine Creek Field
Garrington Leduc A Pool	Long Coulee Field
Ghost Pine Field	Lookout Butte Field
Gilby Field	Malmo Field
Goodwin Field	Marten Hills Field
Greencourt Field	McMullen Field
Hackett Field	Medicine River Field
Halliday Field	Mikwan Field
Harmattan East Field	Mitsue Field
Harmattan-Elkton Field	Moose Field
Highland Field	Nevis Field
Homeglen-Rimbey Field	Newell Field
Hunter Valley Field	New Norway Field
Hussar Field	Nipisi Field
Huxley Field	Obed Field
Innisfail Field	Olds Field
Jarrow Field	Oyen Field
Jenner Field	Parflesh Field
Johnson Field	Pincher Creek Field
Jumping Pound West Field	Plain Field
Killam Field	Prevo Field
Kirkwall Field	Princess Field
Kitsim Field	Provost Field
Lathom Field	Quirk Creek Field
Leckie Field	Rainier Field
Little Bow Field	Ranfurly Field

Retlaw Field	Sylvan Lake Field
Rich Field	Three Hills Creek Field
Richdale Field	Trochu Field
Ricinus Field	Turin Field
Ricinus West Field	Twining North Field
Rockyford Field	Ukalta Field
Rowley Field	Verger Field
Scandia Field	Vulcan Field
Sedalia Field	Warwick Field
Sedgewick Field	Wayne-Rosedale Field
Seiu Lake Field	Westerose Field
Sibbald Field	Westerose South Field
Standard Field	Whiskey Field
Stanmore Field	Whitecourt Field
Strachan Field	Wildhorse Creek Field
Sundre Basal Mannville A Pool	Wildunn Creek Field
Sundre Basal Mannville B Pool	Wimborne Field
Sunnynook Field	Wintering Hills Field
Superba Field	Wood River Field
Swalwell Field	

The area in the Medicine Hat Field being north of Sections 1 to 6 inclusive, in Township 15, and in Ranges 1 to 3 inclusive, West of the 4th Meridian, excepting therefrom Section 7, Township 15, Range 2, West of the 4th Meridian.

6. (1) The Permittee shall satisfy the Board prior to

February 1, 1973, that arrangements have been completed for the acquisition and transportation of gas produced in the Chestermere Field, the Edwand Field, the Killam Field, the Malmo Field, the Newell Field, the New Norway Field, the Trochu Field and the Turin Field and that effective removal of gas produced from the said fields shall commence on or before February 1, 1973, unless upon application by the Permittee a later date is stipulated by the Board.

(2) If the Permittee fails to satisfy the Board at the time and regarding the matters set out in subclause (1), the Board may, at a public hearing, reconsider the circumstances and may delete from this Permit any or all of the fields referred to in subclause (1) and reduce the volumes referred to in clause 2 accordingly.

7. For the purposes of this Permit, where gas acquired by the Permittee from sources other than from pools, fields or areas named in clause 5, such gas shall be deemed to be used first to supply sales to consumers, communities and utilities in Alberta, The Alberta Gas Trunk Line Company Limited fuel and losses and fuel and shrinkage at reprocessing plants.

8. Gas acquired in Alberta by the Permittee, in exchange for equal volumes of gas, adjusted for any differences in higher heating value, produced from pools, fields or areas named in clause 5, may be removed from the Province under the

authority of this Permit.

9. The Permittee shall remove or cause to be removed pursuant to this Permit only such gas as is delivered to it through facilities of The Alberta Gas Trunk Line Company Limited at the interconnections of their pipe lines in the North-east quarter of Section 11 and the South-west quarter of Section 12, both in Township 20, Range 1, West of the 4th Meridian and in the North-east quarter of Section 11, Township 38, Range 1, West of the 4th Meridian.

10. (1) All gas removed from the Province pursuant to this Permit shall be measured by or on behalf of the Permittee by master meters approved by the Board and located at the points at which gas is delivered in accordance with clause 9 by The Alberta Gas Trunk Line Company Limited to the Permittee.

(2) The specific gravity and higher heating value of all gas received by the Permittee through the facilities of The Alberta Gas Trunk Line Company Limited shall be measured by or on behalf of the Permittee at the points at which gas is delivered by The Alberta Gas Trunk Line Company Limited to the Permittee.

(3) The measurements required by this clause shall be made in a manner approved by the Board and shall be reported monthly in a manner approved by the Board.

11. Subject to section 14 of the said Act, all quantities of gas for the purpose of this Permit shall be referred to a

14.65 pounds per square inch absolute pressure base and a 60 degree Fahrenheit temperature base.

12. Notwithstanding any provisions of any contract for the purchase or other acquisition of gas, the Board may require the extraction of any substance or substances except methane from any gas before its removal from the Province pursuant to this Permit.

13. The Permittee will supply gas from the pipe line of The Alberta Gas Trunk Line Company Limited at a reasonable price to any community or consumer within the Province, or to any public utility requiring gas for such a community or consumer, that is willing to take delivery of gas at a point on the pipe line, and that, in the opinion of the Board, can reasonably be so supplied by the Permittee.

14. If any community, consumer or public utility is willing to take delivery of gas pursuant to clause 13 and agreement on the price to be paid for the gas cannot be reached, the price to be paid shall be determined by the Public Utilities Board on the application of an interested party, and the part of the price attributable to transportation shall be based on the assumption that the gas has been supplied from the capable source or sources available to the Permittee nearest to the point of delivery.

15. Notwithstanding the provisions hereof, the Permittee shall comply with the provisions of any Act, competent regulation, order or direction governing the drilling for, production,

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conservation, gathering, transportation, processing, purchasing, acquisition, sale, measurement, reporting, testing, supply or delivery of gas within the Province.

16. Permit No. TC 70-10 is rescinded.

MADE at the City of Calgary, in the Province of Alberta, this _____ day of _____, A.D., 1971.

ENERGY RESOURCES CONSERVATION BOARD

G. W. Govier
Chairman

